



**STATE OF MAINE DEPARTMENT OF MARINE RESOURCES**

**STANDARD OPERATING PROCEDURES**

**FOR**

**THE DIVISION OF PUBLIC HEALTH**

**SHELLFISH GROWING AREA CLASSIFICATION PROGRAM**



## TABLE OF CONTENTS

I.	Division of Public Health Shellfish Program Overview.....	4
II.	Program Structure & Staff Responsibilities.....	4
III.	Staff Contact Information.....	6
IV.	Federal Oversight & FDA Contact Information.....	9
V.	Standard Operating Procedures Overview .....	10
1.0	SOP for Growing Area Classification .....	11
1.0.1.	Growing Area Classification .....	11
1.0.2.	Growing Area Re-Classification .....	12
2.0	SOP for Sampling Plan, Station Location & Sampling Runs.....	14
2.0.1.	Sampling Plan.....	14
2.0.1.1.	Systematic Random Sampling .....	14
2.0.1.2.	Adverse Sampling.....	15
2.0.1.3.	Accelerated Sampling .....	16
2.0.1.4.	Missed/Make-Up Sampling .....	17
2.0.2	Sample Station Location.....	17
	<i>Sampling Station Evaluation Flow Chart.....</i>	19
2.0.3.	Sampling Runs .....	20
2.0.3.1.	Systematic Random Sampling Runs .....	20
2.0.3.2.	Adverse Sampling Runs.....	21
3.0	SOP for Sanitary Survey .....	21
3.0.1.	Sanitary Survey .....	22
3.0.2.	Shoreline Survey .....	23
3.0.2.1.	<u>Shoreline Survey Equipment List .....</u>	25
3.0.2.2.	<u>Preparation for Field Work .....</u>	25
3.0.2.3	Waste Water Treatment Plant Evaluation.....	27
3.0.2.4.	Marina Evaluation.....	32
3.0.2.5.	Stream-Culvert-Drainage Ditch-River Evaluations .....	36
3.0.2.6.	Agricultural .....	37
3.0.2.7.	Wildlife .....	37
3.0.2.8.	Poisonous, Chemical or Deleterious Substances .....	37
3.0.2.9.	Industries.....	38
3.0.3.	Survey Definitions.....	39
4.0	SOP for Water Sample Collection.....	43
4.0.1.	Introduction .....	43
4.0.2.	Equipment & Safety .....	44
4.0.3.	Sample Collection .....	45
4.0.3.3. 1.	Boat Sampling .....	51
4.0.3.3.2.	Cold Weather/Winter Sampling.....	52
4.0.3.4.	Water Temperature .....	52
4.0.3.5.	Observations .....	54
5.0)	SOP for Shellfish Sample Collection .....	55
6.0	SOP for Sample Handling, Transportation & Laboratory Receipt.....	56
6.0.1.	Introduction .....	56
6.0.2.	Sample Handling & Transportation.....	56
6.0.3.	Laboratory Receipt of Sample.....	57
7.0	SOP for Sample acceptance.....	59
8.0	SOP for Conditional Area Management.....	61
8.0.1.	Introduction to Conditional Areas .....	61
8.0.2.	Sampling Requirements for Conditional Areas.....	64
8.0.3.	Conditional Area Re-Opening Criteria.....	65



8.0.3. Specifics on Managing Types of Seasonal Conditional Areas .....	65
8.0.3.1. Post Closure Sample Schedule <u>THIS SECTION UNDER CONSTRUCTION</u> .....	65
8.0.3.2 Fecal Coliform Levels for Re-opening .....	65
8.0.4. Conditional Area Re-opening Reports <u>THIS SECTION UNDER CONSTRUCTION</u> .....	66
8.0.4.1. Seasonal Conditional Areas .....	66
8.0.4.2 Marina Conditional Areas.....	66
8.0.4.3. Waste Water Treatment Plant Conditional Areas .....	67
8.0.4.4. Rainfall Conditional Areas.....	67
8.0.4.4.1 Rainfall Conditional Area Re-opening Verification Study .....	68
9.0 SOP for Emergency Flood Events.....	69
9.0.1. Introduction .....	69
9.0.2. Determination of a Flood Event .....	69
9.0.3 Precautionary Flood Closures.....	72
9.0.4. Implementing a Flood Closure .....	72
9.0.5. Post Flood Sampling Schedule .....	73
9.0.6. Closure Repeal Strategy and Re-Opening Protocol.....	74
10.0 SOP for Staff Training Requirements .....	76
11.0 SOP for Volunteer Training & Coordinating .....	78
12.0 SOP for Vehicle Use .....	79
13.0) SOP for Private Certified Laboratories .....	81
<u>13.0.1 Introduction</u> .....	81
13.0.2. Procedure for Private Laboratory Certification.....	82



## I. Division of Public Health Shellfish Program Overview

The DMR's Public Health Division is responsible for regulating Maine shellfish growing areas according to the guidelines defined in the Interstate Shellfish Sanitation Conference's (ISSC) National Shellfish Sanitation Program (NSSP) Model Ordinance (MO). The Model Ordinance establishes the minimum requirements necessary to regulate the interstate commerce of molluscan shellfish and to establish a program to protect the public health of consumers by assuring the sale or distribution of shellfish from safe sources and assuring shellfish have not been adulterated during cultivating, harvesting, processing, shipping, or handling. Authority to conduct this examination is granted to the commissioner of the Department of Marine Resources under the Maine State Revised Statutes Title 12 Chapter 607 §6172.1: Commissioner's powers, which states:

*"The commissioner may examine the coastal waters and the intertidal zone and adopt rules to close coastal waters or intertidal zone areas if the commissioner determines that any marine organisms are or may become contaminated or polluted. The commissioner may adopt or amend rules as the commissioner determines necessary, setting forth standards for closure of contaminated or polluted areas, giving consideration to established state water quality standards, the most recently adopted federal sanitation standards, or other state or federal public health standards, the most recent generally accepted research data and known sources of pollution in any area, in a manner to protect the public health and safety while allowing reasonable use of the State's marine organisms."*

Maine uses fecal coliform as its bacteriological standard. The water in shellfish growing areas is regularly sampled and analyzed for the presence of fecal coliform bacteria. All shoreline properties adjacent to growing areas are inspected for evidence of existing or potential sources of fecal matter e.g. on-site septic systems, municipal sewage treatment facilities, agricultural/livestock operations, and wildlife. Shoreline surveys are conducted on a regular basis and growing areas are classified accordingly. Maine uses Systematic Random Sampling as outlined in the NSSP MO for monitoring and maintaining the classification of growing areas. Maine utilizes Adverse Sampling as outlined in the NSSP MO for evaluating pollution source impact on shellfish growing areas.

## II. Program Structure & Staff Responsibilities

The State of Maine Department of Marine Resources Growing Area Classification Program is serviced by two ~~laboratories~~ facilities; one in the western part of the state at West Boothbay Harbor, and the other in the eastern part of the state at Lamoine State Park. Each facility is comprised of a growing area classification office and a water quality laboratory. ~~All water and shellfish samples tested for fecal coliform for the NSSP are analyzed in these laboratories.~~



The Director of the Public Health Division supervises all activities of the Public Health Division. The Scientist III Growing Area Classification Program Manager supervises all the activities of the Growing Area Classification Program statewide. ~~Growing Area Classification Program~~. The West Boothbay Harbor (BBH) and Lamoine facilities are each staffed by a two Scientist I positions and two Specialist I positions. ~~Each Scientist I acts as Growing Area Supervisor and manages two Marine Resources Specialist Is~~. When the budget permits, there may be additional seasonal contract employees on staff at one or both facilities. The Growing Area Classification Program is serviced by two laboratories, Boothbay Water Quality (WQ) Laboratory and the Lamoine Water Quality Laboratory. The Microbiologist III is ~~supervisor~~ Laboratory Manager for both the BBH and Lamoine Water Quality Laboratories. The Lamoine Water Quality Laboratory is staffed with a Microbiologist III and a Marine Resources Technician ~~seasonal contract employees as budget permits with support from the Lamoine field staff~~. The BBH Water Quality Laboratory is staffed with a Microbiologist II, Microbiologist I and a two Marine Resources Technician positions. A more detailed description of the Water Quality Laboratories can be found in the Water Quality Laboratory Quality Assurance Manual.

Sample collection is done by the Scientists, Specialists, MR Technicians, volunteers and any Seasonal Contract Employees. Occasionally Microbiologists, Area Biologists, Biotoxin Staff, Marine Patrol officers, Seafood Inspectors, and other specially trained and/or licensed personnel assist in the collection of samples. Sampling for Growing Area Classification is conducted year round.

Report writing is done by the Scientists and Specialists meeting NSSP criteria for content. All documents must meet the DMR Public Health Division peer Review SOP.

The Volunteer Coordinator oversees the annual training and management of all water quality and phytoplankton volunteers. The position works intimately with the laboratory supervisors and supervisory Scientist Is to implement the volunteer portion of the systematic random sample schedule.

The Shellfish Program Coordinator works out of the Hallowell office and is primarily responsible for implementing the Administrative Procedures Act for emergency rule making. The Shellfish Program Coordinator issues certifications to wholesale shellfish dealers, wet storage and bulk tagging permits to the same and maintains the databases.

The Director of the Public Health Division ~~oversees and guides sample scheduling~~, reviews and approves all growing area reports, and is responsible for implementing the Administrative Procedures Act for promulgation of shellfish harvesting area closures and openings. The Public Health Division Director also maintains close contact with other states and countries regarding shellfish program issues (i.e. inspection, growing area classification, laboratory, biotoxin), represents the Department at meetings, is responsible for writing reports, oversees the response to requests for data, and is the contact point for media, industry, and any other public inquiries regarding the Maine Shellfish Program. The Director is also the primary contact for the Food and Drug Administration.



### III. Staff Contact Information

#### **West Boothbay Harbor Lab (Jurisdiction: N.H. Border to the Penobscot River)**

Maine Department of Marine Resources  
194 McKown Point Rd.  
P.O. Box 8  
W. Boothbay Harbor, ME 04575  
Phone: (207) 633-9500  
Fax: (207) 633-9579

Amy Fitzpatrick, Director of Public Health & Shellfish Sanitation Program  
Phone: (207) 633-9554; e-mail: [Amy.Fitzpatrick@maine.gov](mailto:Amy.Fitzpatrick@maine.gov)

Michelle Mason, Shellfish Program Coordinator  
Phone: (207) 624-6570; e-mail: [michelle.mason@maine.gov](mailto:michelle.mason@maine.gov)

Alison Sirois, DMR Volunteer Coordinator  
Phone: (207) 633-9401; e-mail: [Alison.Sirois@maine.gov](mailto:Alison.Sirois@maine.gov)

Anna Bourakovsky, Marine Resources Scientist III, Growing Area Classification Program Manager  
Phone: (207) 633-9501; e-mail: [Anna.Bourakovsky@maine.gov](mailto:Anna.Bourakovsky@maine.gov)

Glenn Nutting, Marine Resources Scientist I  
Phone: (207) 633-9514; email: [Glenn.Nutting@maine.gov](mailto:Glenn.Nutting@maine.gov)

Lorraine Morris, Marine Resources Specialist I  
Phone: (207) 633-9533; e-mail: [Lorrain.Morris@maine.gov](mailto:Lorrain.Morris@maine.gov)

Fran Pierce, ~~Water Quality Specialist~~ Marine Resources Scientist I  
Phone: (207) 633-9511; e-mail: [Fran.Pierce@maine.gov](mailto:Fran.Pierce@maine.gov)

Eric Sroka, Marine Resources Specialist I  
Phone : (207) 633-9500 ; e-mail : [eric.sroka@maine.gov](mailto:eric.sroka@maine.gov)

**Water Quality Laboratory**

Phone: (207) 633-9517

Mercuria Cumbo, Microbiologist III, WQ Laboratory Manager

Phone: (207) 667-5654; e-mail: [Mercuria.Cumbo@maine.gov](mailto:Mercuria.Cumbo@maine.gov)

Cathy Vining, Microbiologist II, WQ Lab Boothbay Harbor

Phone: (207) 633-9682; e-mail: [Cathy.L.Vining@maine.gov](mailto:Cathy.L.Vining@maine.gov)

Gail Parsons, Microbiologist I, WQ Lab Boothbay Harbor

Phone: (207) 633-9515; e-mail: [Gail.Parsons@maine.gov](mailto:Gail.Parsons@maine.gov)

Ed Thier, Marine Resources Technician, WQ Lab Boothbay Harbor

Phone: (207) 633-9557; e-mail: [Ed.Thier@maine.gov](mailto:Ed.Thier@maine.gov)

Heather Gilbert, Marine Resources Technician, WQ Lab Boothbay Harbor

Phone: (207) 633-9500; e-mail: [Heather.Gilbert@maine.gov](mailto:Heather.Gilbert@maine.gov)

**Lamoine Water Quality Lab (Jurisdiction: Penobscot River to the Canadian Border)**

Maine Department of Marine Resources

22 Coaling Station Lane

Lamoine, ME 04605

Phone: (207) 667-5654

Fax: (207) 667-3972

Amy Fitzpatrick, Director of Public Health & Shellfish Sanitation Program

Phone: (207) 633-9554; e-mail: [Amy.Fitzpatrick@maine.gov](mailto:Amy.Fitzpatrick@maine.gov)

Anna Bourakovsky, Marine Resources Scientist III, Growing Area Classification Program Manager

Phone: (207) 633-9501; e-mail: [Anna.Bourakovsky@maine.gov](mailto:Anna.Bourakovsky@maine.gov)

Robert Goodwin, Water Quality Scientist I

e-mail: [Robert.Goodwin@maine.gov](mailto:Robert.Goodwin@maine.gov)

Erick Schaefer, Water Quality Specialist I

e-mail: [Erick.Schaefer@maine.gov](mailto:Erick.Schaefer@maine.gov)

John Fendl, Water Quality ~~Specialist~~ Scientist I

e-mail: [John.Fendl@maine.gov](mailto:John.Fendl@maine.gov)

Mike Loughlin, Marine Resource Specialist I (vacant)

e-mail: [mike.loughlin@maine.gov](mailto:mike.loughlin@maine.gov)



Mercuria Cumbo, Microbiologist III, WQ Laboratory Manager  
e-mail: Mercuria.Cumbo@maine.gov

Desiree Hills, Marine Resource Technician  
email: Desiree.Hills@maine.gov





#### **IV. Federal Oversight & FDA Contact Information**

Program compliance with the National Shellfish Sanitation Program (NSSP) is overseen by the U.S. Food and Drug Administration (FDA contact information below). The FDA conducts a program audit, using NSSP evaluation criteria, annually and reports its findings to the Department and the ISSC.

~~Peter Koufopoulos~~  
Regional Shellfish Specialist  
US Food and Drug Administration  
1 Montvale Ave  
Stoneham, MA 02180  
Phone 781-596-7780  
FAX 781-596-7894  
e-mail: ~~Peter.Koufopoulos@fda.hhs.gov~~



## **V. Standard Operating Procedures Overview**

The Standard Operating Procedures (SOP) maintained by the MDMR Public Health Division are designed to ensure that all individuals engaged in work for the Growing Area Classification Program are operating under a single, uniform set of procedures. To ensure relevance and effectiveness, the Public Health Division regularly reviews and, when necessary, revises its SOP.

For clarity and ease of use, the Public Health Division's Standard Operating Procedures are divided into the following sections:

- 1.0) SOP FOR GROWING AREA CLASSIFICATION;
- 2.0) SOP FOR SAMPLING PLAN, STATION LOCATION & SAMPLING RUNS;
- 3.0) SOP FOR SANITARY SURVEY;
- 4.0) SOP FOR WATER SAMPLE COLLECTION;
- 5.0) SOP FOR SHELLFISH SAMPLE COLLECTION;
- 6.0) SOP FOR SAMPLE HANDLING, TRANSPORTATION & LAB RECEIPT;
- 7.0) SOP FOR SAMPLE ACCEPTANCE;
- 8.0) SOP FOR CONDITIONAL AREA MANAGEMENT;
- 9.0) SOP FOR EMERGENCY FLOOD EVENTS;
- 10.0) SOP FOR STAFF TRAINING REQUIREMENTS;
- 11.0) SOP FOR VOLUNTEER TRAINING & COORDINATING;
- 12.0) SOP FOR VEHICLE USE; AND,
- 13.0) SOP FOR PRIVATE LABORATORY CERTIFICATION

Each section is a manual-like, 'stand-alone' document that provides general context as well as detailed information on the topic covered. Taken as a whole, all the sections constitute MDMR Public Health Division's Growing Area Classification Program SOP.



## **1.0 SOP for Growing Area Classification**

This Standard Operating Procedure covers the following content:

- 1.0.1. Growing Area Classification
- 1.0.2. Growing Area Re-Classification

---

### **1.0.1. Growing Area Classification**

The National Shellfish Sanitation Program (NSSP) has established the shellfish growing area classification standards and program guidelines in the form of a Model Ordinance. This document sets the acceptable levels of fecal coliform in seawater. These standards are used to properly classify shellfish areas based upon the sanitary condition of the area.

The Maine Department of Marine Resources has chosen to switch to a fecal coliform method that was approved for use in the National Shellfish Sanitation Program (NSSP) at the 2003 Interstate Shellfish Sanitation Conference (ISSC). The new method is the Membrane Filtration (MF) for Fecal Coliforms using mTEC agar with a two hour resuscitation step. The geometric mean and the 90<sup>th</sup> percentile are calculated on a minimum of the most recent 30 data points.

During the transition from MPN to MF, the DMR will be accumulating MF data points. The statistical calculations will be a combination of MPN and MF data points. The United States Food and Drug Administration (FDA) has determined that the best way to handle the data is to perform the geometric mean calculations as always for the data set, but to compare the data set to a hybrid weighted 90<sup>th</sup> percentile. The hybrid standard is calculated by weighting the relative contributions of each method to the database; meaning the number of MPN data points reduce and the number of MF data points increase, the 90<sup>th</sup> percentile standard that the sample site is compared to will change over time.

Once all 30 data points are analyzed using MF, the 90<sup>th</sup> percentile for approved classification will not exceed 31 fecal coliforms/100ml and for restricted (for depuration or relay) will not exceed 163 fecal coliforms/100ml. The geomean approved standard of 14 fecal coliforms per 100 ml and geomean restricted standard of 88 fecal coliforms per 100 ml will remain the same for both methods.

Reports that display 90<sup>th</sup> percentiles will show the number of data points derived from MF analysis and will show the appropriate 90<sup>th</sup> percentile standard for that MPN/MF combination for approved and restricted classifications. It must be remembered that this weighted standard is only used for data sets encompassing data from the two different test methods, MF and MPN (3 tube/3 dilution). If decisions are to be made on a single test result analyzed by the MF method or



a multiple number of test results all exclusively analyzed by the MF method, the 90<sup>th</sup> percentile standard is 31 fecal coliforms per 100 ml.

**Fecal Coliform Standards by Shellfish Growing Area Classification Category**

Shellfish Growing Area Classification	Activity Allowed	Geometric mean FC/100ml	90 <sup>th</sup> Percentile (P90) FC/100ML
Approved	Harvesting allowed	≤ 14	≤ 31
Conditionally Approved	Harvesting allowed except during specified conditions	> 14	> 31
Restricted	Depuration harvesting only	≤ 88	≤ 163
Conditionally Restricted	Depuration harvesting allowed except during specified conditions	≤ 88	≤ 163
Prohibited	No harvesting allowed		

To maintain a station's classification, a minimum of six samples in the open status must be collected annually from all sampling stations not classified as Prohibited. Many stations are sampled more frequently because of their classification status or to provide additional water quality data under differing environmental conditions. For detailed information on sanitary surveys to determine growing area classification, refer to 3.0) SOP FOR SANITARY SURVEY.

Annually, at a minimum, the most recent 30 samples that were randomly collected are used to calculate the geometric mean and the P90 to ensure compliance with the classification. Generally, the data spans a five year period of time

Where there are point-sources of pollution, dilution calculations must be done to determine the classification boundaries of the growing areas. Such calculations are critical to accurately determine the location of boundaries between growing areas. Please refer to the FDA Advanced Growing Area Course booklet for details on how to use dilution rates to locate boundary lines between sample stations.

### **1.0.2. Growing Area Re-Classification**

DMR staff monitors the water quality for each growing area on an annual basis to ensure compliance with the MO. Every effort is expended to perform this activity periodically, especially with conditional areas which generally show greater variability in water quality. If this periodic review identifies that conditions have changed and that the current classification is incorrect, immediate action must be taken to re-classify the area. A brief report describing the reasons for the re-classification must be kept on file.



NOTE: For detailed information on Conditional Areas refer to 8.0) SOP FOR CONDITIONAL AREA MANAGEMENT.



## **2.0 SOP for Sampling Plan, Station Location & Sampling Runs**

This Standard Operating Procedure covers the following content:

### **2.0.1. Sampling Plan**

- 2.0.1.1 Random Sampling
- 2.0.1.2 Adverse Sampling
- 2.0.1.3 Accelerated Sampling
- 2.0.1.4. Make-Up Sampling

### **2.0.2 Station Location**

### **2.0.3 Sampling Runs**

- 2.0.3.1 Systematic Random Sampling Runs
- 2.0.3.2 Adverse Sampling Runs

---

### **2.0.1. Sampling Plan**

DMR's Public Health Division utilizes a fecal coliform indicator, systematic random and adverse sampling strategies and data analysis to evaluate the bacteriological quality of its Shellfish Growing Area waters. Each growing area is populated with sampling stations that are positioned to provide adequate data to effectively evaluate the impact of all non-point and point sources of pollution such as streams, land uses, over-board discharge systems (OBDs), and sewage treatment plants which have the potential to introduce pollution into shellfish growing areas. As noted in the Maine Peer Team Review Summary (October 29, 2007 – November 2, 2007) the DMR should maintain land stations and add stations away from shore as possible, striving to collect all, yet realizing that each type of sampling has its own set of constraints. The sampling plan the Department uses to collect and analyze this data is described below.

Samples must be collected at various tidal conditions especially in areas where times of tidal impacts have not yet been adequately determined. As noted in the Maine Peer Team Review Summary (October 29, 2007 – November 2, 2007) the DMR must continue to add data in order to predetermine if and which tidal stages affect the growing area(s). Tidal impacts must be determined to meet the NSSP requirement under the Model Ordinance Chapter IV. @02. (F) (1). If the tidal stage increases the fecal coliform concentration, the authority (DMR), shall use sample results collected during that tidal stage to classify the area.

#### **2.0.1.1. Systematic Random Sampling**

Effective Date: February 10, 2010



The NSSP allows for sampling in either a random or adverse strategy. Systematic Random Sampling (SRS) is based on establishing an annual schedule early in the calendar year and adhering to that schedule throughout that specific year.

In accordance with the NSSP Model Ordinance 2005 edition Chapter IV. (@)(02.)(F)(6.)(b.) states, Maine uses the Systematic Random Sampling method when:

- (i) Sample station locations are adequate to produce the data to effectively evaluate all non-point sources of pollution;
- (ii) Sample collection is scheduled sufficiently far in advance to support random collection with respect to environmental conditions. Compliance requires that, prior to implementation, the schedule for random sampling shall be documented in the master file for the growing area, and if conditions at the time of scheduled sample collection are believed to be hazardous to the safety of the individuals assigned to collect samples, sample collection shall be rescheduled at a later date (Note: ME DMR maintains a list of missed stations and runs and schedules collections as personnel and laboratory space allows);
- (iii) A minimum of six random samples shall be collected annually from each sample station in the growing area;
- (iv) A minimum of two random samples shall be collected annually from each sample station in the growing area while in the inactive status. The sample collection frequency of six random samples per station per year specified under @.02F(6)(b)(iii) must resume at least six months before an area is reactivated; and
- (v) A minimum of the 30 most recent randomly collected samples from each sample station shall be used to calculate the median or geometric mean and 90th percentile to determine compliance with this standard.

An annual sampling schedule (master schedule) is established for all stations by January of each program year. Random runs are scheduled to allow sample space in the laboratory to accommodate emergency sampling, make up of missed samples and runs, conditional area reopening samples and extra samples for pollution source survey work.

The master schedule is maintained in the DMR program files and serves as the work schedule for the water quality staff, volunteers, and lab staff. The scheduling process supports the required randomness with respect to environmental conditions by establishing a sampling date at a minimum of 30 days to as much as twelve months in advance of the actual field date. If a sampling run must be canceled due to unsafe sampling conditions, the sample run or individual samples are worked into the schedule as soon as possible.

#### **2.0.1.2. Adverse Sampling**



In addition to the systematic random sampling strategy, the DMR water quality program also makes use of the adverse sampling strategy to provide additional water quality data to gauge the impact on water quality from: rainfall events, sewer plant malfunctions, bird migrations and other seasonal variations. Under this strategy, water samples are collected in growing areas during specific adversities or 'conditions' to ensure that there is sufficient data to make and support the classification of these growing areas. Samples collected under the Adverse condition are not used in the classification of the growing area.

### **2.0.1.3. Accelerated Sampling**

The NSSP model ordinance ([www.issc.org](http://www.issc.org)) states that the DMR must collect a minimum of six samples a year from all active water quality stations to remain in compliance with the program. The samples collected under an accelerated scenario must meet the requirements of the NSSP; collected year round, under all environmental, hydrographic and meteorological conditions and seasonal conditions. Due to staffing issues and lab capacity DMR is only able to meet these minimum requirements. The NSSP will allow up to twenty four samples a year from active water sampling stations collected every 2 weeks. This accelerated sampling can then be used in data analysis for classification changes leading to faster changes in classification after pollution source abatement occurs and in the presence of an updated shoreline survey.

Accelerated sampling will only be allowed in areas not meeting approved standards where the shoreline survey is less than 5 years old, where point and non-point sources of pollution have been identified, abated and documented and there is the reasonable expectation that water quality has improved. Accelerated sampling will not be allowed for areas that continue to be impacted by point or non-point source pollution or in areas where the shoreline survey is older than 5 years.

The DMR and the town/municipality will first meet and identify areas that are not meeting approved standards. DMR will conduct an inventory of current data and determine the age of the shoreline survey. If shoreline survey work is more than 5 years old, new surveys will need to be conducted and a mandatory training session for the town/municipal official volunteers will take place. After shoreline survey work has been completed, DMR staff will visit all problems noted to confirm then the town/municipality will follow up with pollution abatement. All pollution abatement will need to be documented and sent to DMR. Further training will then be completed and a Memorandum of Agreement signed between the town/municipality and the DMR to begin accelerated sampling for the identified area.

The DMR will work with towns/municipalities under a Memorandum of Agreement (MOA) to provide a schedule for collection, train and certify all volunteers for each task and follow up with field and data analysis results. The participating town/municipality will provide all volunteers for the said task, will be required to assist the DMR with completing any outdated shoreline survey work, provide any and all documentation of pollution abatement prior to beginning scheduled accelerated sampling and agree to contribute all data contracted out to a private DMR/FDA





certified laboratory in the required format and schedule that DMR specifies. This only includes areas/stations not meeting approved standards for the given reporting year.

#### **2.0.1.4. Missed/Make-Up Sampling**

During systematic random sampling, there may be factors that will result in runs or samples being cancelled or missed. To accommodate this and to ensure the randomness of missed runs or stations, in January of each year, the systematic random sampling schedule is set up to provide lab space for emergency, conditional area re-opening and missed station samples.

Missed runs and stations are to be entered into a missed station/run log. Field and lab staff should do periodic queries (at least monthly) of the missed station log and/or database. Every effort should be made to reschedule missed stations and runs promptly, as field staff availability and lab space permits. Constant monitoring of sample numbers keeps the required sample current.

#### **2.0.2 Sample Station Location**

The NSSP requires that the number and location of sampling stations is adequate to evaluate all pollution sources except in prohibited areas. The DMR uses the following criteria for sample site selection:

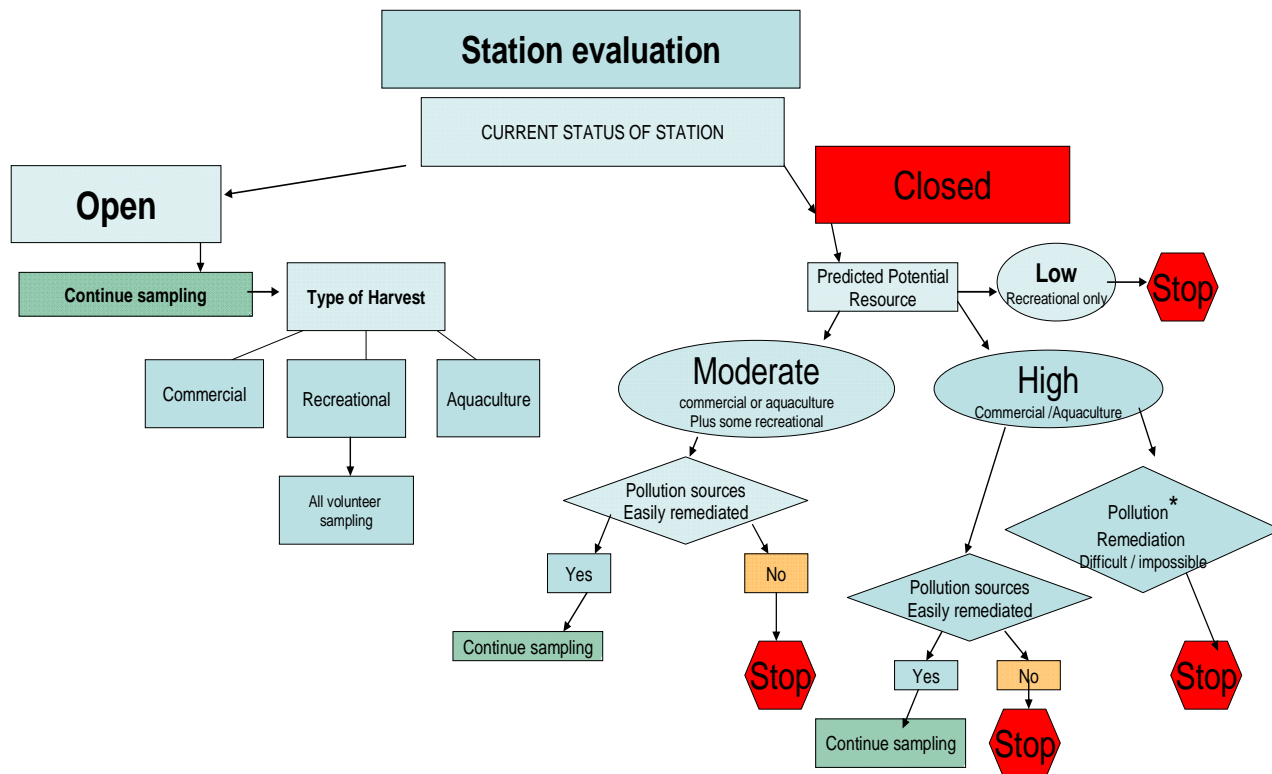
- a. Stations should be located to monitor the overlying waters of shellfish harvest areas; both intertidal and subtidal areas;
- b. Stations should be located to provide information about the impact from nearby pollution sources & potential pollution sources and streams;
- c. Sample stations should adequately monitor the growing area based on impacts affecting the growing area and to monitor classification boundaries;
- d. All classification boundary lines must have a station(s) where ~~measurable non-point~~ pollution in one area might have an impact on an adjacent area.
- e. Stations should be accessible throughout all seasons. Permission from landowner pursuant to law;
- f. GPS locations of all stations must be documented. Within the first year of establishment of a new sample station, determination of the minimum tide stage the sample can be collected must be documented. Existing stations must be documented prior to the 2008 season.



- g. If an established sample station has a safety or access issue and it is determined that the station must be moved, it is acceptable to move the location within a reasonable distance, determined on a case by case basis, of the original location and still enter sample data under the station ID number. If the distance is too great (no longer represents the specific intent of the original station) or the water depth is not a minimum of 18", a new station must be established.
- h. Justification for creating/deactivating(discontinuing)/reactivating/updating of sample station(s) must be submitted on the Water Quality Sample Station Request Form. The completed Sample Station Request Form must be submitted to the immediate supervisor. The supervisor will assure that the database entry and GIS layer are updated and that the dates of completion are added in the MM/DD/YY format.



### Sampling Station Evaluation Flow Chart



\* heavy metals, industry, etc

6/16/2005



### **2.0.3. Sampling Runs**

A water sampling run is an organized collection of individual sample sites that is used to adequately monitor the bacteriological water quality of the near-shore marine environment under most environmental, human or climatic impact conditions. Most sample runs involve upper river estuaries, small bays, long, narrow points of land, relatively flat coastlines or a combination of any of these. Some of these watersheds are included in specific sampling runs, however logistical sampling issues prevents large watersheds from being sampled within any single run. Sites can be located on sandy beaches, in muddy coves or over bold ledge. The sample sites are fixed locations with detailed site directions, GPS coordinates and reference maps. Most sample runs are 30 samples or less.

DMR will utilize volunteer industry or shellfish warden boats where possible and when provided [under a MOA with the DMR] for growing area classification sampling. Where boats are not available or weather events prevent sampling from boats, samples will be collected by land. As noted in the Maine Peer Team Review Summary (October 29, 2007-November 2, 2007) Maine has a very extreme environment, as compared to other states, making the full year-round utilization of boats impossible. When sampling by boat, the standard operating procedures for sample collection in Section 4.0.3.3.2. must be followed. The boat should be operated in such a way as to allow the boat to get within a 300' radius of the established water sample site. Any new boat sample stations created, must meet a minimum of 30 pieces of data to be used for classification purposes. If the sample collection criteria above cannot be met, document the missed station and DMR staff will re-schedule the sample collection as outline in section 2.0.1.4. When working from a boat, make sure the boat is inspected, registered and that it carries all appropriate safety equipment. DMR staff must follow the Boating Safety SOP, which includes, but is not limited to, 2 people per boat, wearing of floatation device and boating safety/CPR training.

If a boat run is cancelled due to a boat breakdown, weather, etc. and the run can be collected by land, the run will be collected by land to maintain compliance with the systematic random sample schedule. Otherwise, the sample run must be re-scheduled as outlined in section 2.0.1.4..

#### **2.0.3.1. Systematic Random Sampling Runs**

DMR personnel are ultimately responsible for meeting sampling criteria described within the NSSP MO. Every effort should be made to reschedule missed stations and runs promptly, as field staff availability and lab space permits. Sample collections are coordinated with the Laboratory and are scheduled to accommodate field staff and laboratory availability and to avoid clustering the required number of samples within a short period of time. For samples fulfilling the SRS requirements every effort should be made to avoid scheduling a sample collection with less than a two week interval between samples.



After sample stations have been determined, sample runs are developed using the criteria outline below:

- i. Every effort is made to develop sample runs so that all samples can be collected in an 8-hour day (for one staff person), considering travel time and tide/weather/ road conditions/staffing based on a flexible-gliding schedule. Sample runs dependent on ferry schedules, extreme ends of the lab jurisdiction, etc. may be an exception;
- ii. Sample runs should be set up so that collection can occur efficiently. Tide charts should be used to determine when there will be adequate water depth (at least 18") to maximize samplers' time.
- iii. DMR staff sample runs should be, when possible, coordinated with volunteer sample runs to facilitate sample pick-ups from volunteers.

### **2.0.3.2. Adverse Sampling Runs**

Adverse sampling is based on the occurrence of an adverse condition that impacts water quality in the growing area as identified in the sanitary survey.

- i. According to the NSSP MO all sampling stations in close proximity to known point source of sewage pollution must be sampled under adverse conditions;
- ii. When an adversity is suspected or has been identified, effort must be made to sample the stations in question under the identified adversity;
- iii. It is important that these stations be sampled under systematic random strategy in addition to the adverse conditions. Samples collected under adverse conditions can be coded as adverse, survey or extra samples in the database system so that data can be sorted based on condition and by continuing this system it should be possible to define the appropriate adverse condition for relevant stations;

## **3.0 SOP for Sanitary Survey**

This Standard Operating Procedure covers the following content:

### **3.0.1. Sanitary Survey**

### **3.0.2. Shoreline Survey SECTION STILL UNDER CONSTRUCTION**

- 3.0.2.1 Shoreline Survey Equipment List
- 3.0.2.2. Preparation for Field Work
- 3.0.2.3. Waste Water Treatment Plant Evaluation
- 3.0.2.4. Marina Evaluation



- 3.0.2.5. Stream-Culvert-River Evaluations
- 3.0.2.6. Agricultural
- 3.0.2.7. Wildlife
- 3.0.2.8. Poisonous, Chemical or Deleterious Substances
- 3.0.2.9. Industrial

### 3.0.3. Survey Definitions

---

#### **3.0.1. Sanitary Survey**

Maine's coast is divided into 45 Shellfish Growing Areas based on the coastal watersheds. The DMR maintains a sanitary survey for each growing area (or subset) which includes a description of the area; an analysis of the shoreline survey and the bacteriological sampling of the quality of the water; and evaluations of the hydrodynamic, meteorological, and geographic characteristics of the area. The determination of the appropriate classification of the area is based upon the data contained in the sanitary survey. Water quality data must be collected continuously and new and existing pollution sources must be examined annually. A new sanitary survey must be written every twelve years.

The classification of shellfish growing areas is based on the development of a Sanitary Survey Report, which incorporates shoreline information and water quality data and evaluates the potential health risk associated with the ingestion of shellfish from the growing area. The guidelines for creating a Sanitary Survey are carefully laid out in the NSSP Guide for the Control of Molluscan Shellfish. Whereas the implementation of a water quality surveillance program is critical to the proper evaluation of shellfish growing areas, equally important is the shoreline survey.

The information obtained by conducting a thorough shoreline survey is valuable in determining, evaluating and documenting the location and potential impact of actual and potential pollution sources. The survey also provides other information to be used in developing a complete Sanitary Survey Report of the growing area. Given the size of Maine's shoreline, it is likely that shoreline surveys will be continually in progress. It is important that shoreline survey information is collected in a consistent manner so that the information may be easily incorporated into the shoreline survey database and the Sanitary Survey Reports to be used for future re-evaluations of the shellfish growing areas.

According to the NSSP, the Sanitary Survey is compiled every 12 years with regular re-evaluations and updates: triennial reports (every three years) and annual reports that reflect changes in the conditions of the growing areas. The triennial reevaluation shall include a review of water quality data, documentation and evaluation of any new pollution sources, a reevaluation of all previously identified pollution sources (which may include a site visit) and a comprehensive report analyzing the sanitary survey data. If the triennial report identifies that conditions have changed and that the current classification is incorrect, immediate action must be



taken to reclassify the area. If a triennial report is not completed the DMR must place the growing area in the closed status.

The annual update must include written discussion of any field observations of the pollution sources which can be accomplished in the course of a drive – through survey, observations made during field work and sample collection or through other sources. The annual update must include a review of the past year's water quality sample results by adding the results to the database and evaluating whether they meet the requirements for the existing classification status. It must include any results of pollution source sampling and any inspection reports from pollution sources; i.e. marina evaluation, wwtp evaluation. A documented evaluation showing that performance standards are being met for any discharges to the growing area. The annual update must also include a brief, written report which documents the findings from the previous year, including a description of monthly re-classifications and explanation thereof.

### **3.0.2. Shoreline Survey**

The NSSP requires that all shoreline surveys meet the following minimum requirements:

- (a) The boundaries, based on the area topography, of each shoreline survey area are determined by an in-field investigation which identifies only the properties with the potential to impact the shellfish waters;
- (b) Each shoreline survey area is identified by a unique designation which results in identification of all data associated with each shoreline survey by the unique designation;
- (c) Each shoreline survey area is investigated and pollution sources evaluated by qualified, trained personnel; and
- (d) Documentation for each pollution source identified by the DMR as affecting a growing area includes:
  - (i) The location of the site on a comprehensive map of the survey area; and
  - (ii) The determination that the pollution source has a direct or indirect impact on shellfish waters: and
- (e) A written summary of the survey findings.

A proper shoreline survey will investigate all dwellings within 500' of the shore (including areas which are sewered), or conduit to the shore in the survey area, or all properties with a potential to impact the growing area. Once the boundaries of the shoreline survey area have been determined, all businesses and residences must be examined and all potential discharges of wastes (raw sewage, kitchen wastes, laundry wastes, agricultural wastes, etc.) must be evaluated. An itemized list of all dwellings must be compiled regardless of survey results and these data



must be documented and added to the shoreline survey database in a manner by which either 1) action can be taken by appropriate officials or 2) a future repeat survey can be conducted efficiently. If a property has a pollution source adversely impacting a growing area a notation must be made and recorded whether it has a direct or indirect impact as defined in Section 3.0.3.. All pollution sources must be identified as either actual or potential and they must be identified as a direct or indirect source of pollution.

The shoreline survey process requires DMR staff to conduct a physical inspection of all shoreline properties, which have the potential to create a public health concern by contributing fecal matter to the growing area. All actual and potential pollution sources, their distance and potential impact to the growing area must be identified, evaluated and documented. Distances noted should document the distance from the pollution source to the shore when possible. DMR staff inspects each developed property to determine the location and condition of the on-site septic system (unless the area is served by a municipal sewer). If present at the time of the visit, the property owner is interviewed about their system to learn its age, location, and history of any problems. Staff also inspects each property for signs of septic system malfunction or illicit discharges such as a washing machine that may be discharging to a land or storm drain. Undeveloped properties are also surveyed to look for evidence of wildlife. All streams, stormwater pipes, and other water sources entering the growing area are sampled for fecal coliform analysis during the shoreline survey. The results of these inspections are compiled into a shoreline survey log which becomes part of the sanitary survey for the area.

Upon finding any failing septic systems or suspected problems, DMR staff closes the impacted portion of the growing area to all harvesting and reports these findings to the licensed plumbing inspector of the municipality in which the property is located as well as that municipality's Shellfish Warden and Shellfish Commission Chairperson. The DMR has no authority to require that these problems be corrected. Enforcement action can only be initiated by municipal authorities or in some instances, by the Maine DEP.

In addition to observations of potential human impact, observations and documentation must be made regarding:

- Animal husbandry;
- Agriculture;
- Wildlife;
- Industrial properties;
- Marinas
- Geological character;
- Obvious hydrologic factors; and,
- Real or potential shellfish resources.

Drainage ditches seeps and streams, as well as any other potential source of pollution that the surveyor feels may impact the growing area, must be evaluated.





GPS coordinates must be documented for all actual pollution sources. GPS coordinates must be documented for all streams, pipes, conduits to the shore. GPS coordinates are for the purposes of mapping and for consistency.

When conducting a shoreline survey, sample the pollution source (when possible), take the GPS coordinates of the site and take and record flow measurements using a flow meter, “cork” method or container method. Be sure to have along the following equipment:

#### **3.0.2.1. Shoreline Survey Equipment List**

- GPS receiver
- Range finder
- Flow meter
- Fluorescent color tape
- 5 gallon bucket
- Notebook
- Sample bags
- Digital camera
- Flow measurement equipment
- Field notebook

#### **3.0.2.2. Preparation for Field Work**

Before shoreline survey work begins in an area you must notify the municipality that the agency will be doing work in the area and what that work entails. A copy of a form letter is available on the shared drives. DMR staff members should notify the municipality at least 2 weeks in advance of shoreline survey activities taking place.

A great deal of time and effort can be saved by familiarizing yourself with the area. This means obtaining maps of the area, preferably USGS 7.5 minute topographic maps (1:24,000 scale). The recommended maps to use for shoreline survey work are topographic maps, municipal tax maps, GIS generated maps (where available) and nautical charts (where applicable). It is most convenient to make a map enlargement of the survey area, allowing for space to itemize and add dwellings. Other preliminary information which may be available through municipalities, DEP or DMR records can help to provide a basic understanding of the sanitary condition of the area prior to the survey.

It is important both for practical reasons as well as logistical reasons to define the survey area prior to a field visit. Each Growing Area must have a defined upland boundary. The defined area will be given a letter designation which will allow the incorporation of all information into a computer data base.

Prior to beginning the survey, organize your time and personnel so as to maximize use of time. Developed areas should always be surveyed on foot. Occasionally there may be remote areas for



which use of a boat is appropriate. Depending on the history of the area, there will be different areas of focus determined by current classifications and known recent pollution abatement activity. The raw information is retained in a central computerized database and a summary of the problems will be compiled for use in developing the Sanitary Survey Report.

When you begin your survey and arrive at the first property, you will begin filling out your Shoreline Survey Report Form. It is extremely important to correctly fill in the form. The information on the form helps the data entry and field staff personnel to quickly and correctly analyze the information. Non-legible information will compromise the data. Please use a pen NOT a pencil or marker, which can be hard to interpret. If you make an error on your survey report form, put a single line through the error, write the correction above/near it and initial the change. You may also put a single line through an entry and start a new entry for the property in the next space provided on the form.

At the top of the form, you will fill in general information that is not specific to a single site. This would include the header information on the form. A sample Shoreline Survey Report Form follows:

Surveyor(s) \_\_\_\_\_ Date \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Shoreline Survey ID	Town	Tax Map	Lot Number	Area Name	OBD #
Owner Last Name	Owner First Name	Street Address			
Pollution Type/Code	Problem: Y or N Year Round or Seasonal	Pollution Distance to water: Ft.	PS Latitude: ° ' " N	PS Longitude: ° ' " W	
Pollution Source: Actual or Potential	Pollution Path: Direct or Indirect	Pollution Source Description:			
Property Description: _____					

**Surveyor(s):** Full first and last name of those performing the survey for the day.

**Date:** Date the survey took place.

**Page\_\_ of \_\_:** Number the pages and at the end of the day, fill in the “of\_\_” space.

**DMR ID:** The DMR ID is the database alpha-numeric code assigned to each tax map and lot number in a growing area. If this is blank on your sheet, the data entry person will assign a number when performing data entry.

**Town:** The name of the town/municipality where the survey is being performed.

**Tax Map:** Tax map number assigned by the town/municipality. This can be found on the tax map that you have.



**Lot #:** The lot number assigned by the town/municipality. This can be found on the tax map that you have.

**Last Name:** Last name of the property owner. If it is an association, LLC or estate, fill in the name of the entity.

**First Name:** First name of the property owner. If it is an association, LLC or estate, fill in the name of the entity starting in the Last Name box and overflowing, as needed, into the First Name box.

**Street Address:** The number and street address of the property you are evaluating.

**Dist Ft:** Distance measured from the pollution source to the water.

**Y/S:** Year round or seasonal property. Default Y if it is not confirmed a seasonal property.

**Problem Y/N:** Is this property a problem? Default Y, if you feel that it needs to be reported to the local codes enforcement for follow up.

**PS code:** Pollution source code. The pollution source codes are in section 3.0.3.

**OBD #:** If you note OBD in the PS Code box, try and follow up and fill in the OBD number assigned by the DEP.

**Area Name:** The body of water the property abuts, the land drains to or the stream flows into.

**Description:** description of the septic system or lack thereof. Date installed, data last pumped/repaired/replaced, type, where is it in relation to the house? Is there a leach field and where? Holding tank? Septi-tech? Note the type of system or lack of system in this field. You should make a note of the name of the person that you spoke to when you visited the property in this box.

**Actual/Potential:** You must make an assessment and note whether or not this is an actual or potential pollution source. See definitions in section 3.0.3.

**Direct/Indirect:** You must make an assessment and note whether or not this is a direct or indirect pollution source. See definitions in section 3.0.3.

### **3.0.2.3 Waste Water Treatment Plant Evaluation**



The NSSP requires that growing areas which are impacted by a wastewater treatment plant outfall must be evaluated on the following plant function and performance standards to include:

- (i) Peak effluent flow, average flow, and infiltration flow;
- (ii) Bacteriological quality of the effluent;
- (iii) Physical and chemical quality of the effluent;
- (iv) Conditions which cause plant failure;
- (v) Plant or collection system bypasses;
- (vi) Design, construction, and maintenance to minimize mechanical failure, or overloading;
- (vii) Provisions for monitoring and inspecting the waste water treatment plant; and
- (viii) Establishment of an area in the prohibited classification adjacent to a wastewater treatment plant outfall in accordance with §E. Prohibited Classification;

The evaluation of the treatment plant and outfall during the sanitary survey report may meet the criteria for a conditional classification under the NSSP Guide for the Control of Molluscan Shellfish Model Ordinance (NSSP MO) Chapter IV. @03.(C). If the area meets the criteria for a conditional classification a management plan must be developed that meet the criteria of NSSP MO Chapter IV. @03.(C)(2.)(c.) and (f), (g) and (h):

- (c) For management plans based on wastewater treatment plant function or pollution sources other than wastewater treatment plants, criteria that reliably predict when an area that was placed in the closed status because of failure to comply with its conditional management plan can be returned to the open status. The minimum criteria are:
  - (i) Performance standards of the plan are fully met;
  - (ii) Sufficient time has elapsed to allow the water quality in the growing area to return to acceptable levels;
  - (iii) Sufficient time has elapsed to allow the shellstock to reduce pathogens that might be present to acceptable levels. Studies establishing sufficient elapsed time shall document the interval necessary for reduction of coliform levels in the shellstock to pre-closure levels. The study may establish criteria for reopening based on coliform levels in the water; and
  - (iv) Shellstock feeding activity is sufficient to achieve coliform reduction.
- (f) Procedures for immediate notification to the Authority when performance standards or criteria are not met;
- (g) Provisions for patrol to prevent illegal harvest; and
- (h) Procedures to immediately place the growing area in the closed status in 24 hours or less when the criteria established in the management plan are not met.

The management plan must be reevaluated annually (NSSP MO Chapter IV.@03.(C.)(3.)(a.). The reevaluation shall include:



- (i) Evaluation of compliance with the management plan;
- (ii) Determination of adequacy of reporting of failure to meet performance standards;
- (iii) Review of the cooperation of the persons involved;
- (iv) Evaluation of water quality in the growing area with respect to the bacteriological standards for its classification;
- (v) Field inspection of critical pollution sources, where necessary; and
- (vi) Written findings, evaluations and recommendations.

The treatment plant performance standards must be assessed annually through available inspection reports and a review of existing performance standards. The triennial evaluation may include an inspection of the treatment facility and/or additional effluent samples to determine the impact on the growing area.

For more detailed information on management plans go to Section 8.0 of this document.

The DMR Growing Area Classification staff members annually assess wastewater treatment plants (WWTP) by using the WWTP Evaluation Checklist evaluation form. The staff member will email or mail via USPS, the checklist to the plant operator prior to a visit or phone call. The returned checklist form will be shared with the DEP inspector so that the DEP inspector can add information on the annual performance inspection, any violations and the resolution of those violations. The WWTP Evaluation Checklist follows below:



### Wastewater Treatment Plant Checklist (01-02)

Date:

Plant name:

Address:

Waste Discharge License: (number, date, public\private)

Plant phone number:

Operator's name:

Date constructed:

Area served:

Population served: (individuals\houses)

Other responsible individuals:

DEP inspector:

DMR reviewer: (you)

List individuals who are alerted in case of malfunctions that impact, or may impact, shellfish growing areas.

#### A. Collection System Information:

Type of waste: (municipal; industry; pump out companies)

Combined\separate: .

Total wet weather flows:

Identify overflow points.

Amount of rainfall causing overflow:

Flow due to infiltration during wet weather.

Is there any collection system upgrading taking place?

#### B. Pump Stations:

Locations

(ask for\make map, list pump flows)

Do any pump stations flood due to malfunction?

Are there bypasses or overflows present at the pump stations?

Is there a regular maintenance schedule for the pump stations and their alarms?

Emergency equipment:

(narration)

#### C. Plant Design:

Type of treatment. (narration; primary\secondary; clarifiers\RBC\lagoons) .

Design flow and year flow started.

Can wastewater bypass the plant?

Is the plant subject to flooding during wet weather or high tides?

What operations have duplicate units available when maintenance is conducted?

(narration)



Are holding ponds present?

Plant coverage:

(narration)

Emergency equipment:

(narration)

#### D. Outfall

Name of receiving water\class.

Outfall description.

(size of pipe; location; diffuser??; approximate distance to shellfish areas)

Depth of discharge receiving waters:

(high\low tides; currents; etc)

#### E. Plant operations:

Average daily flow:

Average wet weather flow:

Max hourly flow:

Max wet weather flow:

% BOD removal:

% SS removal:

Is there a routine maintenance schedule or check log for controllers?

Explain your standard operating procedure for heavy wet weather flows.

If activated sludge, what measures are taken to prevent loss of biosolids?

Sludge treatment.

(methods; what is mixed with it; yearly volume; spread site ? near shellfish area)

#### F. Chlorination:

Is there continuous chlorination?

Type of chlorination:

Are dual chlorinator units available and in working order?

Is the chlorination switch over procedure designed to avoid interruption of effluent chlorination? .

If hypochloride is used, are there dual solution tanks available, each with 36 hours of capacity? (Describe)

Chlorination contact time at average daily flow:

and at peak hourly flow:

Chlorine residual in effluent (after typical detention) in ppm.

Analytical method used for determining the chlorine residual. (lab instrument)

Is the chlorine residual measured continuously?

how often is the residual measured?

Describe chlorinator alarm system if present.

Describe the point in the system at which the chlorine is added to the waste stream.

Is rapid mixing of the chlorine and wastewater accomplished? (mixers\dynamic flow)



Describe the detention tank. (baffled\serpentine)

What is the frequency and test method of bacterial testing of the effluent?

G. Poisonous or deleterious substances:

(Federal requirements; state requirements; materials tested for)

H. History:

(this is information from interview with the DEP inspector. Should include concerns of DEP; training and abilities of operator; re-occurring problems at plant; how it might affect shellfish growing areas if problems)

Additional information to be gathered during the shoreline survey:

An assessment must be made of the Stormwater collection system, combined sewer overflows, pump stations, etc. GPS coordinates of each must be obtained for mapping purposes. A report of their permit criteria, performance standards and a determination of the limits of the system(s) are required. Information about alarming and telemetry is essential.

Licensed overboard discharges are prevalent on the Maine coast. An assessment of how many are in the survey area must be obtained from the town or from the Maine DEP.

#### **3.0.2.4. Marina Evaluation**

Each mooring field and marina proper in the growing area must be evaluated. The marina performance standards must be assessed annually through DMR developed inspection reports and a review of existing performance standards. The triennial evaluation shall include an inspection of the marina. The NSSP defines a "marina" as an area with 10 or more boats with heads. If it is determined in the sanitary survey report findings that an area can be conditionally managed on the seasonality of a "marina" then a management plan must be developed.

The management plan must be reevaluated annually (NSSP MO Chapter IV.@03.(C.)(3.)(a.). The reevaluation shall include:

- (i) Evaluation of compliance with the management plan;
- (ii) Determination of adequacy of reporting of failure to meet performance standards;
- (iii) Review of the cooperation of the persons involved;
- (iv) Evaluation of water quality in the growing area with respect to the bacteriological standards for its classification;
- (v) Field inspection of critical pollution sources, where necessary; and
- (vi) Written findings, evaluations and recommendations.

An inspection document should include the following information for each marina checked:





- Name of marina;
- Status of marina operation (still in business?);
- Date & time of inspection;
- Name of person who conducted inspection;
- Dates of marina season;
- Number and type of boat(s) at marina proper (in slips);
- Number and type of boat(s) on moorings;

Documentation on each of the points above should also include other pertinent comments (For example, under types of boats; lobster boats, skiffs, sailboats, cuddy cabins, etc.).

DMR staff members must use the Marina Evaluation form to record information from field reconnaissance and from the interview of the marina operator. The Annual Marina Evaluation Form is below:

## ANNUAL MARINA EVALUATION FORM

GROWING AREA \_\_\_\_\_

GPS Coordinates: Lat: \_\_\_\_\_  
Long: \_\_\_\_\_

Date \_\_\_\_\_ Interview by \_\_\_\_\_

Name of Marina \_\_\_\_\_

Physical Address \_\_\_\_\_

Person Interviewed \_\_\_\_\_ Phone  
# \_\_\_\_\_

Email: \_\_\_\_\_

Operating Dates \_\_\_\_\_ Peak Season: \_\_\_\_\_ Number of Slips \_\_\_\_\_

Number of Moorings \_\_\_\_\_

Types of Boats \_\_\_\_\_

# of boats w/ toilets \_\_\_\_\_ Number of boats lived on \_\_\_\_\_

How often? Weekends/Summers/Year Round \_\_\_\_\_

Is there a pump-out facility/boat? (circle) is it operational? \_\_\_\_\_



Is the pump out convenient for all boats, describe access, distance, cost, any onsite monitoring of pump out use \_\_\_\_\_

---

---

---

Is there an onshore toilet? \_\_\_\_\_ Shower? \_\_\_\_\_

Type sewage disposal (circle)? Municipal Sewer Septic System Holding Tank Overboard Discharge

If septic system or holding tank, how often is it pumped? Do you have a contract with a local pumper? Last time pumped? Alarmed? \_\_\_\_\_

Any discharge pipes to shore, including stormwater pipes:

---

Discuss land drainage in area (potential non-point runoff): \_\_\_\_\_

---

Discuss receiving waters (depth, area, embayments, resources): \_\_\_\_\_

---

Is there a marine railway/haul out? \_\_\_\_\_

Hull Scraping Activity? \_\_\_\_\_

Are there Marina Regulations? \_\_\_\_\_

Are you a member of Clean Marinas? \_\_\_\_\_

Harbor Master: \_\_\_\_\_ Phone # \_\_\_\_\_

Harbor management plan? \_\_\_\_\_

Is there ongoing effort to educate boat owners regarding environmental protection? If so, what? \_\_\_\_\_

---

Are there any areas that are designated No Discharge Areas or No Discharge Zones? \_\_\_\_\_

Who enforces the NDA/NDZ? \_\_\_\_\_



How is the NDA/NDZ enforced?\_\_\_\_\_

**\*\* Optional observation (not part of the interview):**

Are there any fuel tanks over the water or near the water?\_\_\_\_\_Estimated gallons\_\_\_\_\_

Is the tank in a containment?\_\_\_\_\_

GPS coordinates: Lat:\_\_\_\_\_Long:\_\_\_\_\_

Estimated Distance from tank to shore:\_\_\_\_\_

-----

Is this area a marina conditional area? Y/N (circle one) Regulation Number-Title\_\_\_\_\_

\_\_\_\_\_

Dates area is open for harvesting\_\_\_\_\_

Date Inspected for **CLOSED** period\_\_\_\_\_Inspector\_\_\_\_\_

Number of boats present?\_\_\_\_\_Is marina operating?\_\_\_\_\_

Date Inspected for **OPEN** period\_\_\_\_\_Inspector\_\_\_\_\_

Number of boats present?\_\_\_\_\_Is marina still operating?\_\_\_\_\_

Does water quality meet **CONDITIONALLY APPROVED** standards? Y/N (circle one)

The area within and around any marina which is in or adjacent to a shellfish growing area shall be classified as conditionally approved, conditionally restricted or prohibited. Waters in or adjacent to marinas may be impacted by pollution associated with the marina (heavy metals, sanitary pollution, etc.). A dilution analysis must be performed to determine if there is an impact to the shellfish growing area(s) which based on the following:

- a.) Volume of water in the vicinity of the marina (mean low water);
- b.) Slip and/or mooring occupancy rate for the marina of > 10 boats with thru hull marine sanitation devices;
- c.) An actual or assumed rate of boats which will discharge untreated waste ( if the DMR cannot determine specific occupancy rates per boat during the marina evaluation or



investigation, then the NSSP MO requires a minimum occupancy rate of 2 persons per boat);

d.) Occupancy rate per boat (number of people per boat);

e.) A fecal coliform discharge rate of  $2 \times 10^9$  fecal coliform per day;

f.) The assumption that the wastes are completely mixed in the volume of water in and around the marina;

g.) Pump out stations.

Marina calculations can be made by using the following spreadsheet, which can be found at:  
Y:\Water Quality\Excel Spreadsheet\Field Calculations\Marina calculation.xls

### **MARINA CALCULATION SPREADSHEET**

This colored cell requires an input, all others are calculated.

Number of boats considered to be "live aboard"= 8

Number of people per boat (if known)= 3

If unknown, estimate 2 per boat.

Then total number of people from this marina= 24

Estimated number of fecal coliform colonies/person/day= 2,000,000,000

Total number of fecal coliform colonies/day from this marina= 48,000,000,000

Fecal coliform bacteria must be diluted down to <14 FC/100ml of water.

There are 283 100ml units in one cubic foot.

Therefore, the bacteria must be diluted down to 14FC x 283 units per cubic foot, OR 3,962 colonies per cu.ft.

48,000,000,000 FC colonies from this marina divided by 3,962 colonies/cu.ft.= 12,115,093 cu.ft. of receiving waters for minimum dilution.

Average depth in this marina= 20 feet

Cu.Ft. required for dilution divided by average depth = 605,755 square feet of surface area required for this marina

OR 778.3 Feet on a side

Square ft. times 0.092903 = 56,276 square meters of surface area  
Square meters times 0.0002471 = 13.91 Acres

#### **3.0.2.5. Stream-Culvert-Drainage Ditch-River Evaluations**

Stream/culvert/drainage ditch/river samples must be collected to assess impact during initial sanitary survey, triennial years and annually when the stream/culvert/drainage ditch/river has documented elevated fecal scores if it is affecting the growing area. A written assessment of actual or potential impact must be documented in the triennial and sanitary survey reports. Data



for all streams/culverts/drainage ditch/rivers shall be maintained in the database. Sample collection at a minimum should be during times of peak run off, dry periods and when adverse conditions have been identified on a case by case basis. Stream/culvert/drainage ditch/river locations must be identified with a GPS coordinate and maintained in the shoreline survey database.

#### **3.0.2.6. Agricultural**

The shoreline survey and annual drive through survey must be conducted to locate and assess agricultural activities. Some examples of agricultural activities include, but are not limited to:

- Domestic pets
- Kennels
- Feed lots
- Dairy/beef/fallow deer/horse/fowl farms
- Horse riding facilities
- Zoos; petting/rehabilitation, etc.
- Manure spreading within the coastal zone
- Gentleman/personal farms
- Composting facilities
- Apple/blueberry/vegetable farms

The location and specifics regarding the activities must be documented. Specifics include, but are not limited to, number and type of animals, how manure is handled, slope of the land and runoff potential from agricultural activities, setback distances from fencing to any stream, conduit to the water or actual growing area. If manure or composted septage is spread on agricultural fields, what time of year is it spread and how much per acre must be documented. Horses and dogs that are run on beaches should be documented including, time of year, manure handling, etc.

GPS coordinates of the operation must be taken and added to the database for mapping purposes. GPS coordinates of the manure pile or enclosure must be taken and added to the database for mapping purposes.

#### **3.0.2.7. Wildlife**

Documentation must be made of any flocks of waterfowl and an estimation of their number given. Populations of wild animals such as deer and muskrat must be noted and where possible an estimation of their number given. Identify and assess any wildlife, domestic animals, resident or migratory bird populations and recreation areas which allow pets or horses in the area. Documentation of how fecal matter is controlled for domestic animals in these areas is essential.

#### **3.0.2.8. Poisonous, Chemical or Deleterious Substances**



The level of surveillance for poisonous and deleterious substances will vary widely. The intensity of the surveillance will be driven by a history of marine biotoxin contamination, sanitary survey findings, or findings from investigations by other state or federal agencies or academia. A review of existing background data derived from national and international monitoring programs can also be useful (O'Connor, 1996; Beliaeff *et al*, 1997). Possible sources should be identified through the sanitary survey which should offer enough information to perform an assessment to determine whether or not a potential problem exists and whether a need for further field study exists. Sampling for specific chemical contaminants in shellfish is recommended by the NSSP only when the pollution source survey reveals a potential problem, or if there is concern because of a lack of information.

When poisonous or deleterious substances are found in shellstock, the NSSP requires that the Department evaluate the levels that may be present against known tolerance levels in human foods or other appropriate information, and determine what action, if any, should be taken. Additional information concerning this topic can be found in the NSSP Guidance Documents: *FDA Action Levels, Tolerances and Other Values for Poisonous or Deleterious Substances in Seafood* (ISSC/FDA, 2002); *Shellstock Relay* (ISSC/FDA, 2002); and *Guidance for Developing Marine Biotoxin Contingency Plans* (ISSC/FDA, 2002). In the absence of specific tolerance or action levels, decisions must be made on a case-by-case basis using the best available knowledge. The DMR consults with the DEP and Maine CDC on toxin and deleterious substance issues.

### **3.0.2.9. Industries**

The shoreline survey must document direct discharges such as industrial waste discharges that may have an impact on shellfish growing areas. Industrial discharges do not only need to have fecal pollution as a contaminant, many other poisonous and deleterious substances can be present in industrial discharges that can impact public health. Non-point sources of pollution (e.g., storm water runoff ) should be noted in industrialized areas such as storm water pooling areas and large tracts of parking lots or other impound areas. Industrial wastewater treatment facilities should be evaluated in terms of actual loading versus design capacity, type and concentration of pollutants discharged, effectiveness of their treatment processes and pollution control devices. Industrial discharges often are permitted through the National Pollution Discharge Elimination System (NPDES) or Maine Pollution Discharge Elimination System (MPDES) which are administered by EPA and Maine DEP respectively. Information can be obtained from those sources.



### 3.0.3. Survey Definitions

When documenting pollution sources the DMR uses the following definitions:

**Actual (A)** – Something that is a known source of pollution, and is, or is capable of, causing a violation of NSSP bacteriological standards for approved shellfish growing waters during the time of observation. A source can only be described as ‘Actual’ if (1.) It has been found to have consistently high bacteria levels. (2.) It is determined, beyond a reasonable doubt, that the source is polluting, or capable of polluting the surrounding area, e.g. a WWTF outfall or failing septic system. Actual pollution sources must be re-sampled and re-evaluated a minimum of every three years.

**Potential (P)**– Any source found which has the potential to infrequently and/or unpredictably releases contaminants to the surrounding shellfish growing waters at levels, which are in violation of NSSP bacteriological standards. Examples would include sources like pipes, flowing or not, streams, road swales, etc. During an initial shoreline survey all sources found will be classified as potential until further bacterial investigations can be conducted. Potential pollution sources must be re-evaluated, through sampling or other means, at least every three years.

**Direct (D)**: proceeding in a straight line or by the shortest course; straight; undeviating; not oblique: *a direct route*.

**Indirect (I)**: not in a direct course or path; deviating from a straight line; roundabout: *an indirect course in sailing*.

**Potential – Low Priority** – Any pollution source found which meets the definition of ‘Potential’ with no likely means of abatement. Low priority sources will not be followed up in as much detail or in as timely a manner as ‘Potential’ sources. Examples would include sources like old broken pipes, salt marsh pannes, or indirect sources far up in the watershed. Potential – Low Priority pollution sources must be re-evaluated, through sampling or other means, at least every three years.

**Investigated/Clean** – Any pollution source, actual or potential, that has been investigated, by means of bacterial sampling, and found to be at levels which are below NSSP bacteriological standards.

Potential pollution sources are documented as follows:

**Animal Farm Runoff (AF)**– Water that runs off the land into streams or other surface-waters, originating from an area where animals are raised and/or housed.

**In ground septic field (IG)**



**Intermittent Stream (IS)**– A freshwater stream that only flows during periods of precipitation or snow melt. Stream is dry during certain periods of the year.

**Malfunctioning Septic System (MS)** – A septic system that is not performing according to its design specifications. Can cause/be detected by overland flow or groundwater seeps near a leach field.

**Outhouse (OH)**– An outdoor toilet not connected to any type septic system or WWTF.

**Perennial Stream (Steady Stream) (SS)** – A freshwater stream that flows continually during the entire year with the exception of periods of extreme drought or when frozen.

**Town system (TS)** – Municipal, public or otherwise communal system that moves sewage to a central treatment plant.

**Pipe** – a man-made conduit through which liquid can flow. This does not include road culverts.  
Types of pipes include:

<b>AP</b> Active straight pipe
<b>CD</b> Cellar drain
<b>GD</b> Gutter drain
<b>IP</b> Inactive straight pipe
<b>LD</b> Land drain
<b>OD</b> Licensed overboard discharge
<b>PD</b> Pool drain
<b>SD</b> Sink drain
<b>SO</b> Septic overflow pipe
<b>WO</b> Well overflow

**Vegetable or fruit farm (VF)**

**Groundwater Seep** – Percolation of water through the soil from a source under the ground. (Does not include the drainage of water from the surface of a tidal marsh at low tide.)

**Marina** – A basin containing docks, slips, and boating supplies (fuel, repair equipment, waste pump out capabilities) used for docking or storing vessels. Constructed to provide temporary or permanent docking space for more than 10 boats.

**Mooring Field** – An area of water (usually outside of the marina proper) containing buoys or floating docks anchored to the seabed for boats to tie up to. Constructed to provide temporary or permanent docking space for more than 10 boats.

**Pump Station** – A facility installed in sewer or water collection systems to pump sewage





through forced mains to a higher elevation and/or treatment facility.

**NPDES Outfall** – The place where effluent is discharged into receiving waters from a facility with a National Pollutant Discharge Elimination System permit, e.g. Waste Water Treatment Facility outfall pipe.

**NPDES Facility** – The actual building(s) where waste, to be released through the NPDES outfall pipes, are generated and stored, e.g. Waste Water Treatment Facility and associated holding tanks and ponds.

**Road Swale** – A low, wet piece of land used to channel storm water runoff from a road surface. Typically runs parallel to the road.

**Road Culvert** – A man-made conduit (box shaped or round) used to convey water under a road.

**Salt marsh Ditch** – A long, man-made, narrow channel in a salt marsh designed to facilitate draining. Typically 3 ft or less in width and 1-2 ft in depth.

**Sewer Line** – A man-made conduit used to transport sewage and refuse, and will consist of either gravity lines or forced mains.

**Tidal Creek** – A small stream influenced primarily by tidal waters. Typically found in salt marshes, concentrating the drainage of the marsh during low tide. Typically 4-10 ft in width and 3-6 ft in depth.

**Tidal River** – A moderate to large sized river influenced primarily by tidal waters. Typically greater than 10 ft in width and greater than 6 ft in depth.

**Groundwater Seep** – Percolation of water through the soil from a source under the ground. Does not include the drainage of water from the surface of a tidal marsh at low tide.

**Holding Tank (HT)** - Holding tanks are designed to receive and hold the domestic wastewater leaving a structure. This wastewater, in turn, is pumped out and transported to a municipal treatment plant or to an approved land spreading site. The average person may generate 45 to 75 gallons of wastewater per day. Thus, a family of three can expect to fill a 1,500 gallon holding tank every 6 to 10 days. Holding tank pumping is costly and the holding tanks require continuous supervision on the part of the municipality to assure proper maintenance and pumping.

Every holding tank shall be pumped at least once a year, providing the system has been used. [Title 22 M.R.S.A. §22 Chapter 20 (2000.3.1).

The owner or agent for the owner of a holding tank shall retain for a period of three years the copies of the pumping records, water use records (if required) and the current agreement between the owner and tank pumper. A copy of these records shall be made available to the plumbing inspector upon his/her request. [Title 22 M.R.S.A. §22 Chapter 20 (2000.3.4).



The holding tank shall have visual and audible alarm devices to assure the tank is always pumped before it is full. [Title 22 M.R.S.A. §22 Chapter 20 (2000.3.8)]

**Pit Privy or Outhouse:** Pit privies are intended to receive and store human wastes in an excavation below the toilet(s). A pit privy is considered a “disposal field” for the purpose of setback distances in Chapter 7, except for the distance requirements from a building. Pit privies may be part of a larger building. [Title 22 M.R.S.A. §22 Chapter 20 (706.1)].

**Written Report Format** –Authorization statement for report at head of document, standardized major headings, maps, conclusive statements, analysis of data if presented in charts, graphs, diagrams or maps, appropriate map size to make image readable, PEER REVIEW. At the end of the shoreline survey, the surveyor must write a summation and enter the findings in the shoreline survey database. The surveyor must also provide a detailed, comprehensive map of the survey area identifying the type and location of all pollution sources identified.



## 4.0 SOP for Water Sample Collection

This Standard Operating Procedure covers the following content:

### 4.0.1. Introduction

### 4.0.2. Equipment & Safety

### 4.0.3. Sample Collection

- 4.0.3.1. Confirm schedule
- 4.0.3.2. Water Quality Report Form Instructions
- 4.0.3.3. Sample Collection Instructions
  - 4.0.3.3.1. Boat Sampling
  - 4.0.3.3.2. Cold Weather/Winter Sampling
- 4.0.3.4. Water Temperature
- 4.0.3.5. Observations

---

### 4.0.1. Introduction

The following standard operating procedure is to be used by all DMR staff and volunteers when collecting water samples for fecal coliform analysis. As this is a bacterial analysis, cleanliness and careful attention are critical to ensure a reliable sample. Since the seawater samples are analyzed microbiologically, it is extremely important that sample collection is conducted using **sterile technique and that extreme care is taken to prevent contamination of the sample**. Laboratory findings are dependent upon your following proper, aseptic technique.

In the microbiology laboratory, seawater samples collected for the purpose of classifying shellfish growing areas are analyzed for fecal coliform bacteria which are a potential indicator of human sewage in the water. Human sewage contains potentially pathogenic bacteria, viruses, and parasites which can accumulate in the gut of filter-feeding shellfish and cause illness in people who eat them. Fecal coliform are a sub-set of bacterial species which are part of the larger coliform group of bacteria which, in the marine environment, have a high probability of being associated with fecal matter from warm-blooded animals. Fecal coliform are readily and inexpensively analyzed in the lab, and have been selected by the U.S. Food and Drug Administration (FDA) as an indicator organism suitable for the evaluation of the sanitary condition of seawater.



The DMR Volunteer Coordinator is the immediate supervisor and contact for volunteers, although the data collected from a particular area by volunteers will be used by the Water Quality staff member responsible for that area. (See Program Overview for addresses and phone numbers for DMR water quality staff).

Before volunteer sampling work begins, and annually thereafter, the DMR Volunteer Coordinator and the corresponding area Water Quality Staff will meet with volunteers for a comprehensive training on the Water Quality Sampling Program and visit the stations that volunteers will be sampling. Equipment and coaching on the sampling technique is provided to all to ensure the successful collection of high quality samples. Because the sampling technique can be awkward initially, the DMR encourages all samplers to practice the procedure as often as necessary to ensure sample integrity.

#### 4.0.2. Equipment & Safety

- Maps, GPS Coordinates and directions for sampling stations;
- DMR Water Quality Report datasheet forms;
- Sampling tongs;
- “Whirl-Pak” 120 ml sampling bags [*Plan to have at least one extra bag per sample site in case you get a sample bag with a leak. If a bag leaks or tears, discard the sample and collect another sample using a new bag.*];
- Metal dial field thermometer;
- Ice packs to keep samples chilled;
- Freezer boxes or wire sample racks for your cooler to keep bags upright in cooler;
- Glass, liquid-filled cooler thermometer;
- Sample cooler;
- Waterproof marker (“Sharpie”) to label bags;
- Pen to record data on WQ Report datasheet forms.
- Waterproof hip-boots or waders;
- Your own transportation (vehicle or boat);
- First aid kit;
- Watch or automobile clock;
- Cell phone (recommended).

**Note:** Volunteers should work with the Volunteer Coordinator on equipment needs.

Collecting water samples by foot involves walking over uneven surfaces, wading into growing area waters to a minimum depth of 18”, and working in sometimes cold, rainy, and slippery conditions. Some mudflats are unsafe to traverse due to the extremely fine sediments, which can create “honey pots”. These are patches of soupy, unstable mud where it is possible to quickly sink into the mud to above your knees, waist, or higher. In these circumstances, it may be difficult or impossible to free yourself without assistance. **If you have any doubts about your**



**safety DO NOT collect the sample.** Note safety concerns on the field sheet with the station number.

When collecting water samples by boat make sure the boat is inspected, registered and carries all appropriate safety equipment. DMR staff members are required to follow the Department Boating Safety Policy.

Each vehicle or staff member will have a first aid kit and cellular phone. When working alone, it is recommended that the sampler make sure someone knows they are sampling, their planned route for the day and an estimate of the time of return.

Samplers are expected to dress for the weather. If it is a hot, sunny day, make sure to wear a hat and sunscreen and bring plenty of water to avoid dehydration.

When collecting your sample by land, you must walk into the water to a minimum depth of 18", so hip boots or waders are very important - especially when walking through mud flats. Samples may be collected from shore from a dock or bank when the water is at least 18" deep.

Sampling runs will be cancelled when state offices are closed due to inclement weather, and on a case by case basis as determined by the DMR. In the event of a missed run due to hazardous conditions, the missed run will be handled as described under the missed run section 2.0.1.4..

#### **4.0.3. Sample Collection**

It is very important to adhere to the sampling schedule generated by the DMR. The schedule is extremely important to the validity and acceptability of Maine's Water Quality Program. The schedule is "random" meaning that it is meant to get data from different tidal stages, different seasons, and different weather conditions. By creating the sampling schedules at the start of each sampling year, the DMR staff is randomly selecting dates with no prior knowledge of the exact conditions that will exist on any particular date thus ensuring that samples over time at any given site will represent all the various conditions that may affect water quality. Once an area has been classified, it requires a maintenance sampling schedule of at least six samples a year. Over time, this results in a high probability for a wide variety of weather, season, tide, and other environmental conditions. **No sample collection date can be changed without the permission of the MDMR. No samples can be added or dropped from the sample run without the permission of the MDMR.** Samples cannot be collected prior to 0600 (6:00am) unless it is an emergency OR prior permission has been obtained.

The sample runs are assigned to DMR staff and volunteers at the beginning of the month and year, respectively. The SRS schedule is online in MS Outlook under Public Folders/DMR/Division Calendars/Public Health. Volunteers will be notified and the schedule confirmed with the volunteer coordinator in accordance with the Volunteer SOP. All sample collectors should confirm the date of the sampling run, which sampling run is assigned, confirm that they have a current sample station map and directions and have all equipment needed.



When you arrive at the first sample station you will begin by filling in the Water Quality Report Form. It is extremely important to correctly fill in the form. The information on the form helps the lab personnel to quickly and correctly analyze your samples. Missing or non-legible information will compromise the data. Please **use a pen**, NOT a waterproof marker, which can be hard to interpret. If you make an error on your field sheet, put a single line through the error, write the correction above/near it and initial the change. Before you begin to sample for the day, you may fill out general information that is not specific to a single site. This would include the header information on the form. A sample Water Quality Report form follows:

<u>Field</u>	<u>Content</u>
Collected by:	The acronym for your group/ your name(s) (e.g. YSC/John Smith)
Date Collected:	The sampling date
Area Letter & Name or Run #:	The DMR shellfish growing area letter (A - Z); and the geographic name of the area*
Run: Scheduled/Makeup/Reopen/Flood	

\* Volunteers should check with the DMR Volunteer Coordinator or the appropriate WQ staff member for the area name and the shellfish growing area letter.

The “**Examined by:**” and “**Date Examined:**” fields will be filled in by DMR lab staff - leave these blank.

In the “**Comments**” column at the right of the datasheet and in the “**Remarks**” section below the data entry columns, put any additional information that may be helpful to staff when interpreting the analysis results. For example:

- Did you see something that you do not usually see in very close proximity to the station that might be a source of fecal pollution (ducks, cormorants, seagulls, etc.)?
- Was there land runoff due to a recent storm event?
- Were there signs of waterfowl or wildlife populations in the general area?
- Did you miss a station normally sampled? If so, explain why (e.g. tide too low, access blocked, etc.).

The purpose of the remarks is to give supporting information to the staff. When you are collecting samples, you are the eyes in the field. You see the conditions in which the samples were collected, and sometimes these remarks will help the staff to understand the reasons for a certain water score or point to a persistent pollution problem.

<b>Missed Station</b>	If the station cannot be collected for the following reasons, use the following codes: <b>T</b> = tide (too low to sample, less
-----------------------	---



than a minimum of 18" at station), **A** = access (the station was not accessible due to trespass or natural obstructions, **S** = safety, **I** = ice (the station was iced over and water not available), **O** = other (you must note what the "other" is in the comment box)

**Area Letter** Record the Growing Area Letter of your sample site (e.g. WA, EB).

**Station #** Record the station number (e.g. 17).

**Military Time** Record the time of sample collection. Use the 24 hour clock -- military time – no colon (e.g. 1400 vs 2:00 PM)

**Boat/Land/Shellfish** "L" = if the sample was taken from land or  
"B" = if the station was sampled from a boat

For shellstock samples use the following codes: C = soft shelled clams, M = mussels, Q = quahogs or hard shelled clams, O = oysters.

**Temp** Water temperature to the nearest degree Celsius °C measured at sampling station using your metal dial field thermometer

**Random or Adverse** "R" for random (unless you are otherwise instructed)

**Condition or Adversity(ies)** Use the letter code(s) taken from the Adversities List on the reverse side of the Report Form (eg. boats, wildlife, precipitation etc) that best describes the potential pollution sources that you observed in the field separate from the station justification

**Wind Direction** Record the direction from which the wind is blowing at each station using one of the following codes: N, NE, NW, S, SE, SW, E, or W. If it is calm, use CL as a code.

**Status** See your sample schedule for the current status (e.g. Open or Closed)

**Salinity (staff field)** DMR laboratory staff will record the salinity when they analyze the sample.

**MF** DMR staff will record the coliform score after analysis. CFU /100ml or FC/100gr(staff field)

The annual sampling schedule provides information regarding the current status (Open or Closed) and classification of the all sampling stations. Please consult your schedule when filling out the "Open or Closed" column of your Water Quality Report Form.





Samples that are collected for additional information outside of the SRS or Adverse condition sampling regimes will be coded "E" under the STRATEGY heading on the field sheet.

Make sure that you are using only "Whirl-Pak" brand bags provided by the MDMR. "Whirl-Pak" bags have a yellow wire tab printed with the "Nasco Whirl-Pak" brand name across the top and a broad white label across the middle of the bag front. Please, do not use the old style bags with the white wire tab across the top of a clear bag and no label.

The sterile sample bags are made of transparent polyethylene and sealed with a perforated top which is torn off just before the water sample is collected. Each sample bag must be labeled with the identifying information explained below using a waterproof marker before the sample is collected. Remember to label BEFORE you sample with the supplied 'Sharpie' permanent marker because it is impossible to write on wet bags. Please try to keep the information within the white label area on the front of the bag. If you must stray outside of this area, use the area just below (rather than above) the label so that the information is visible after the bag is whirled closed. It is easiest to label the bag before leaving your vehicle as you double-check your sampling schedule to confirm that you are at the correct sampling site and check the time which must be recorded on both the sample bag and the Water Quality Report Form.

Be sure to include both the area letter and the station number on the bag. Record the time (in military format) that you collect your sample.

Write the following data in the white label area on the front of the sample bag:

Area letter and station number;

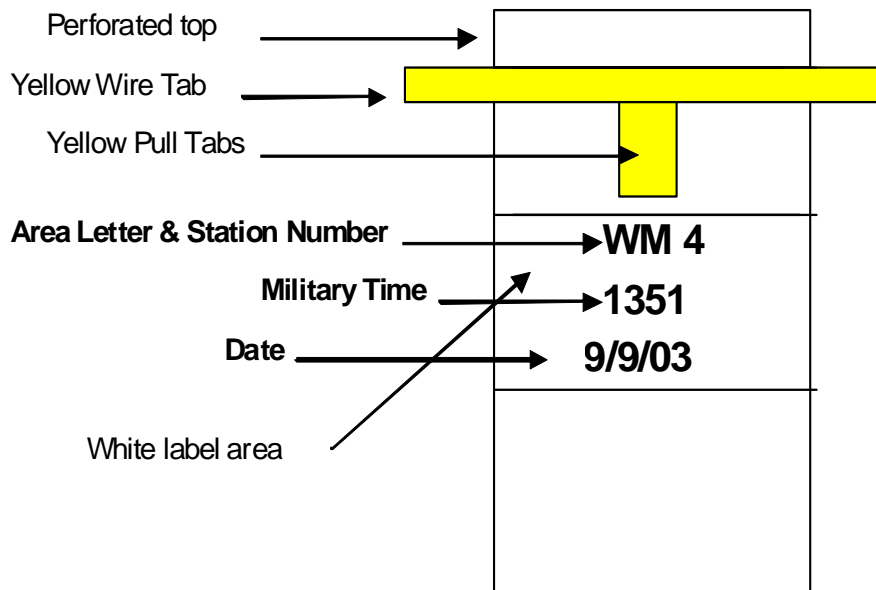
Time (military format);

Date (month/day/year).





### EXAMPLE WQ SAMPLE BAG WITH SAMPLE LABEL



Every attempt should be made to collect the water sample as close as possible to the GPS mapped sample site position. Many sample stations cannot be collected during the lower tides simply because there is not a minimum water depth of 18" at that time. Some samples can be collected if the sampler samples by boat (or walks) a short distance from the GPS mapped location, however, the sampler has to use his/her best judgment to determine if the water collected is still a representation of the typical overlying water at the mapped location. Other important requirements include:

- i) **DO NOT** collect the sample from a channel or stream which may be flowing across the flat from the upland area. These streams are predominately fresh water and not representative of the water that the shellfish was exposed to at the higher tide stages;
- ii) **DO NOT** collect your sample from puddles or pools that may have been stranded in depressions on the flat as the tide receded. Samples taken from pools or puddles at low tide are essentially a pollution source sample and are not representative of the water that the shellfish are exposed to at higher tide stages;
- iii) **DO NOT** collect your sample after moving seaweeds around;
- iv.) **DO NOT** scrape the bottom or disturb and suspend sediments while collecting your sample;
- v. **DO NOT** sample the surface layer, sample only if you can plunge the bag to a depth of 8-10" below the surface.



- vi. **DO NOT** travel more than a 300 foot radius seaward from the normal high tide sampling station site. DMR will identify a list of specific beach stations which can be collected >300 feet from the established station site.

There must be a minimum of 18" of water depth in order to collect your sample following the proper procedure with the sampling tongs.

Sampling tongs are used to hold the bag during sample collection to minimize the handling and contamination of the bag. The tongs also make it possible to collect the water sample from 8-10" below the surface to avoid debris that may be floating on the water surface. The sampling bag is secured to the sampling tongs by clamping the alligator clips onto the white pull tabs on either side of the yellow wire tab. Hooking the bag to the clips is an awkward procedure but with practice you will develop a technique that works best for you. The following are the required steps for proper sample collection:

1. Start by holding the tongs under your arm with the clips parallel to the ground with the opening of the clips facing toward the middle of your body. Place the bag between the alligator clips with the yellow wire tab parallel to the ground and with the bag mouth facing in the same direction as the opening of the clips, toward the middle of your body. Take the white pull tab on one side of the yellow wire tab and securely clamp it into the teeth of the clip on that side; repeat on the opposite side.
2. When sampling by boat, make sure that the keel and the engine of the boat do not touch the bottom and disturb sediments in any way. There must be a minimum of 18" of water on site for the sample to be collected. If sediments have been suspended, wait until they are taken away by the current before you collect your sample. You must always collect the sample on the upstream side to avoid sampling water that may contain sediments that were suspended. Sampling must occur within a 300' radius of the established station.
3. When sampling by land, wade into the water to a depth of at least eighteen inches. Take extreme care to not stir up the bottom. If sediments have been suspended, wait until they are taken away by the current before you collect your sample. You must always collect the sample on the upstream side to avoid sampling water that may contain sediments that were suspended when you walked out to the station.
4. Pull the top perforated flap from the bag and put the top in your pocket. **Do not touch the top of the bag with your fingers.**
5. **KEEPING THE BAG CLOSED UNTIL IT IS SUBMERGED TO SAMPLING DEPTH**, plunge the bag 8 to 10 inches below the surface. Allow the tongs to open after the bag is submerged. Quickly draw the bag through the water in an upstream direction, away from your body, to fill the bag completely. If there is no current, push the bag through the water horizontally away from your body. **Before pulling it back up to the surface and out of the water, close the bag by bringing the clips back together while the bag is still submerged.**



6. Withdraw the sample bag from the water and remove the bag from the tongs, holding it by its yellow wire ends. The bag must be filled to between the two bold black lines in the upper area of the white label; the 100 ml Fill Line and the 4 oz Fill Line. **Do not fill above the 4 oz Fill Line.** If you have too much water, squeeze the bag by pinching it a third of the way down, to expel the extra water. Allow some air to enter the bag before closing it. ***Critical – the bags must be shaken by the lab staff prior to analysis to ensure that the sample is well mixed. The air pocket provides the extra space in the bag to allow for this mixing.***
7. Twirl the bag closed by holding it by its yellow wire ends on either side of the bag opening and spinning the bag three or four turns. This will create a firm pillow-like bag with an air pocket. There should be an air-pocket of an inch or so and the bag should feel firm. Secure the bag by crossing the two yellow wire tabs above the closed bag to form an "X". Fold one tab towards the front of the bag and one tab towards the rear of the bag. Do not twist the tabs as you would on a bread bag tie. Gently squeeze the bag to check for leaks and to make sure that it is securely fastened. The folded tab "X" closure creates a secure closure that is easy for the lab staff to open and keeps the wire tabs away from the bag (and adjacent bags) to avoid accidental puncturing during sample transport.

If you notice a leak, label a new bag and take another sample. If you have left the sampling site and notice that you have a leaking bag, label a new bag and using aseptic technique; carefully transfer the sample from the leaking bag to the new labeled bag. DO NOT place the leaking bag into a new bag because the water which leaks out of the sample bag into the new bag must be considered contaminated and can not be used for analysis.

8. Stand the bags upright in the wire rack in a cooler with ice packs and a cooler thermometer. Sample bags must not be submerged in melt water from ice. Place the samples in the rack in the order that they are listed on the datasheet (for example):
  - a. Sample one goes in the lower left front space in the rack;
  - b. Sample two goes immediately behind it, and so on;
  - c. Once the first row is full, front to back, place your seventh sample in the front of the rack in the next row to the right;
  - d. Fill the rack again front to back and left to right.

#### **4.0.3.3. 1. Boat Sampling**

DMR will utilize volunteer industry or shellfish warden boats where possible and when provided [under a MOA with the DMR] for growing area classification sampling. Boats must also ensure that an adequate depth (a minimum of 18" of water) is present at the station when the sample is



collected. As noted in the Maine Peer Team Review Summary (October 29, 2007-November 2, 2007) Maine has a very extreme environment, as compared to other states, making the full year-round utilization of boats impossible. When sampling by boat, the standard operating procedures for sample collection in Section 4.0.3. is followed. The boat should be operated in such a way as to allow the boat to get within a 300' radius of the established water sample site. If the sample collection criteria above cannot be met, document the missed station and DMR staff will re-schedule the sample collection as outline in section 2.0.1.4. When working from a boat, make sure the boat is inspected, registered and that it carries all appropriate safety equipment. DMR staff must follow the Boating Safety SOP, which includes, but is not limited to, 2 people per boat, wearing of floatation device and boating safety/CPR training.

If a boat run is cancelled due to a boat breakdown, weather, etc. and the run can be collected by land, the run will be collected by land to maintain compliance with the systematic random sample schedule. Otherwise, the sample run must be re-scheduled as outlined in section 2.0.1.4.

#### **4.0.3.3.2. Cold Weather/Winter Sampling**

When sampling in the winter, all attempts should be made to use safe practices. It is recommended that cleats be used if it is icy, snowshoes if it is necessary to walk long distances in deep snow, carry cell phones for emergency calling and use 4-wheel drive vehicles if sampling runs are in remote areas or on back roads. For safety purposes, do not walk out onto accumulated ice packs over coves and wear your DMR provided suspender type auto-inflating personal floatation device.

Do not drill holes in ice to collect a sample.

Aside from safety issues, there are water sample integrity issues with cold weather sampling. Samples with ice or ice slurry cannot be analyzed for fecal coliforms. Bacterial cells tend to burst when subjected to freezing; any freezing that occurs once the sample has been collected will alter the original concentration of fecal coliforms in that sample. If the sample is collected where ice is present, every effort should be made to exclude ice from the sample collection. If ice slurry is present, the slurry must be expelled before closing the bag. The sample must be protected from freezing and ice formation from sample collection site to eventual delivery to the laboratory. This may mean carrying the sample in a pocket from sample site to the cooler in the vehicle. It may mean keeping the cooler inside the vehicle during the sample collection trip and transport to the laboratory; the coolers are not designed to protect from freezing if they are subjected to freezing temperatures and wind chill conditions. Freezing wind chill conditions can develop on a cold day in the bed of an open pick up truck during transport.

#### **4.0.3.4. Water Temperature**



Water temperature is a standard environmental parameter and is routinely measured any time water samples are taken for any type of analysis. Temperature may be correlated to the growth or presence of various marine organisms and microorganisms and may be helpful in explaining the analysis results and understanding the impact of conditions observed in the field.

The dial bimetallic field thermometer that is used by DMR has a round, dial face and a metal stem, which is the sensing unit to be immersed in the water. These thermometers are mechanical; meaning that the temperature recorded on the dial is the result of the expansion of the metal wire housed in the stem and connected to the thermometer dial. The thermometer's scale,  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , is in degrees Celsius. The temperature should be read to the nearest  $1^{\circ}\text{C}$ .

All thermometers are relatively fragile instruments requiring special treatment for accurate measurements. Rough handling of these dial thermometers can affect the connection between the dial and the stem. When not in use, store thermometers in a protected location such as your sample cooler to reduce handling and abuse.

For ease of use in the field, you may want to equip your thermometer with the following: a small float (simply push the pointed metal stem gently through a small block of styrofoam or a cork) which will keep the dial face above the water for easier reading, and a string (tied around the metal stem under the dial face) which will provide a tether to keep the thermometer from being swept away from you by the wind or waves.

*NOTE: Check your thermometer's operation frequently*

Although each thermometer is annually calibrated against a NIST-certified thermometer by the lab staff, you should also check your thermometer at the start of each field day to make sure that it is responding appropriately. Place your metal field thermometer in your sample cooler along with your cooler thermometer before you start on your sampling trip. When you get to your first sampling site, compare the temperature readings on both thermometers. They should be within a degree of one another. If you find a larger discrepancy, make a note of the difference in readings on your Water Quality Report form and request a replacement thermometer from the volunteer coordinator or another member of the DMR staff.

To take the water temperature measurement, follow these steps:

1. Drop your field thermometer into the water, at each sample station, before you collect your water sample. The metal stem should be completely immersed. The metal equilibrates to the ambient water temperature quickly; typically in less than one minute;
2. After collecting your water sample, check the thermometer dial to be sure that the reading has stabilized and read the temperature on the dial face to the nearest  $^{\circ}\text{C}$ . Keep the thermometer's stem immersed while you read the temperature. The thermometer responds too quickly to temperature change to allow an accurate reading if the thermometer is pulled from the water to be read;



3. When you return to your vehicle, record the temperature in the “Water Temp” column of the Water Quality Report form.

#### 4.0.3.5. Observations

If you have not already done so, complete the data required in the Water Quality Report heading. As you collect each sample you will need to enter your station number, sampling time, water temperature, and your field observations for each station.

Look around your sampling location to check for **adverse conditions** which may be potential sources of fecal pollution. Examples include birds, streams or stormwater pipes which flow only during wet weather, etc.. Look on the reverse of your Water Quality Report form for a list of **Adversities** and the codes to be used on the field sheet. Also, in the remarks section, please note if there has been **precipitation** in the past 24 - 36 hours. You may have had a local rainstorm that was not recorded by any of the rain gauges that are monitored along the coast.

Please observe whether the wind is blowing at each station. If it is blowing, record the direction from which it is blowing: N, NE, NW, S, SE, SW, E, or W. If it is calm, use CL as the code. You do not need to estimate the wind speed, just the direction.

If you see something which can not be adequately described with a code, enter a description in the “**Comments**” column at the right side of the datasheet in the datasheet row of the station at which you made the observation. You may also record general observations that pertain to all stations in the “**Remarks**” area at the bottom of the datasheet.

Note: For complete sampling handling instructions, see SOP 6.0 for Sample Handling & Lab Receipt



## 5.0) SOP for Shellfish Sample Collection

In its ongoing efforts to monitor shellfish quality in certain areas, DMR will occasionally collect shellstock to be analyzed for fecal coliform. When collecting a shellfish sample, all cleanliness precautions taken when collecting a water sample must be closely followed. No broken, dead or crushed shellstock will be accepted.

The following is a list of needed equipment for shellstock sampling:

- DMR Water Quality Report Form (see instructions for form on page 36 of this document;
- Wear a watch or have some timepiece with you;
- Additional cooler space to allow adequate physical separation from water samples;
- Clam hoe;
- Plastic bags;
- Waterproof marker ("Sharpie") to label bags;
- **Pen** to record data on datasheet form;
- Clipboard;
- Ice packs to keep samples chilled;
- Calibrated Glass, liquid-filled cooler thermometer;
- Maps and directions to sampling stations;
- Hip-boots or waders (do not sample barefoot).

Shellstock samples shall contain at least 12 animals and should yield 200 grams of shellfish tissue. No broken, dead or crushed shellstock will be accepted. Exceptions will be made in emergency situations when a sample is absolutely necessary and there is not enough stock at the sample site or when a sample of >12 animals fails to yield 200 grams of tissue.

Samples shall be placed in a clean waterproof plastic bag and identified with location and time and date of collection.

There is a field data sheet that must accompany the samples that must contain:

- Sampler's name;
- Date;
- Area number;
- Sample location;
- Shellfish code as outlined on page 37 of this document; and,
- Time of collection.





## **6.0 SOP for Sample Handling, Transportation & Laboratory Receipt**

This Standard Operating Procedure covers the following content:

- 6.0.1. Introduction
- 6.0.2. Sample Handling and Transport
- 6.0.3. Laboratory Receipt of Sample

---

### **6.0.1. Introduction**

The integrity of laboratory results is greatly affected by the handling of the sample from time of collection to analysis. It is imperative that the sample does not deteriorate or become contaminated before it reaches the laboratory. With microbiological samples, the issue also becomes one of maintaining the viability and retarding growth of the organisms during this period of time. The FDA itemizes in the Shellfish Laboratory Evaluation Checklist the requirements for the handling and transportation of water and shellfish samples so as to maintain the integrity of the sample. This SOP outlines the procedures for the proper handling and laboratory receipt of samples in order that the laboratories remain in compliance with the FDA laboratory certification program.

### **6.0.2. Sample Handling & Transportation**

After completing the sampling run the samples will need to be transported to the DMR laboratory. The samples must be kept properly cooled by checking the cooler thermometer and adding more ice packs if needed. The goal is to chill the samples quickly and to maintain the samples between 0° C and 10° C. You may need to add or replace ice packs to maintain the cooler at < 10°C. However, each time the samples are transferred to a new cooler, the thermometer must be transferred with the samples and the chain of custody log must reflect this transfer with date/time and temperature; all fields in the chain of custody must be completed. In cool weather, a layer of ice or ice packs covering the bottom of the cooler is sufficient, however during hot weather you will need an additional layer on top of the samples in order to keep the temperature at <10°C. In cold weather the samples and cooler may need to be transported inside the vehicle rather than outside, such as in the bed of a pickup truck. It is imperative that the samples do not freeze during any portion of the transport. Samples with ice, slush or an ice crust on the surface will not be analyzed.





- All samples are to be stored in insulated ice chests with ice or cold packs so as to maintain the temperature between 0<sup>o</sup>-10<sup>o</sup>C until delivery to the lab.
- A temperature blank with a thermometer in it must be kept in the cooler for monitoring the temperature. Upon receipt at the lab this temperature is recorded on the field sheet.

For water samples to be considered credible and valid, DMR must be able to account for the handling of the samples from the time they are collected until the time they are analyzed by the DMR WQ Lab. This record of handling is called the 'Chain of Custody'. If you deliver your samples to the lab, you are responsible for the handling of the samples until someone at the lab receives them. In this case you would sign as the relinquisher and a DMR lab staff would sign as the receiver. You should initial the "relinquisher" line and fill in the "date/time/cooler" information as well. The DMR staff will initial the "received by" line. If you collect the samples and give them to someone else to deliver to DMR lab, you would still be the relinquisher and need to initial and fill in the date/time/temp data as noted above. The transport person would become the receiver, and then the relinquisher when they deliver the samples to the DMR lab. The DMR staff person who accepts the samples becomes the second receiver.

For chain of custody purposes if samples are transferred to another individual/s, the field sheet accompanying the samples must be signed by the person relinquishing custody and the person receiving custody with the date and time of transfer.

The "Entered by:" and "Date" fields will be filled in by the DMR staff that enters the information into the computer database program.

### **6.0.3. Laboratory Receipt of Sample**

The samples must be delivered to the lab so that analysis can be performed within the acceptable holding time, 30 hours for water samples and 24 hours for shellfish. The following are the steps that should be taken to ensure proper laboratory receipt of samples.

All samples should be stored in the laboratory sample refrigerator immediately upon arrival at the lab. The sample racks from the cooler go directly in to the laboratory refrigerator. Read the thermometer temperature and record it on the datasheet(s).

Each laboratory has a sample log-in sheet that is located on the clipboard where the field sheets are left. The log must be filled out completely with:

- Date/time of receipt;
- Temperature of the received samples;
- Type of sample;
- Date of collection;
- Number of samples;
- Collector and the person receiving and logging in the samples.



Datasheets are to be left on the bottom clipboard hanging on the wall to the left of doorway that goes into the lab prep room. Fill in the data needed on the form in the top clipboard. Most of the information is self-explanatory except “type of sample”, put A1 in this space.

Before you leave the laboratory make sure that the Chain of Custody is properly and completely filled out. Additionally, the field sheets accompanying the samples must be:

- Signed by the person relinquishing sample; and,
- Signed by the person accepting the samples in the lab.

When a field person logs in the samples, it is very important that the laboratory personnel are aware of their arrival.



## **7.0 SOP for Sample acceptance**

All samples collected are the property of the State. Samples can be rejected for the following reasons:

1. The sample is outside of the temperature range of 0°C - 10°C;
2. The sample is outside of time range of 24 hours for shellfish or 30 hours for water;
3. The sample has an ice slurry or ice surface;
4. The sample bag is leaking or torn and the sterility and integrity of the sample is compromised;
5. There is no field log (water quality report form) accompanying samples.
6. The chain of custody has not been filled out.
7. The samples were not scheduled and there is no media/room/staff/time to initiate them.
8. The water sample bag is not filled to 100ml;
9. The sample is not identified properly or there is more than one sample bag with the same information;
10. The shellfish sample does not contain  $\geq 12$  shellfish (unless circumstances permit smaller sample submission);
11. The water sample does not have adequate air space or enough empty bag space to introduce an adequate air space (without having to expel sample water);
12. The sample bags are dirty;

Questionable samples should be immediately reported to the Growing Area Supervisor (and Volunteer Coordinator if it involved a volunteer collector), the Microbiologist III and the Division Director. The problem should be verified by the supervisor or another DMR staff person (if the supervisor is not immediately available) and noted on the field sheet and initialed by the lab staff and other verifying person. The supervisor and lab personnel should consult with the employee or volunteer who collected the sample(s). The Microbiologist III and/or the Division Director, if available should be consulted about how to handle the sample. When they are unavailable and a decision must be made, the first six bulleted items are grounds for rejecting the sample without analyzing, otherwise the sample should be analyzed and appropriate action will be taken regarding the results at a later time. If it is an unexpected sample, every effort



should be made to analyze the sample unless there is no lab space availability. Except for emergency samples, random run and are priority followed by other previously scheduled samples. If and when a sample is discarded there must be written documentation of why the sample was discarded with the signature of the supervisor, Microbiologist III and Division Director. The documentation shall be placed in the growing area file.



## 8.0 SOP for Conditional Area Management

This Standard Operating Procedure covers the following content:

- 8.0.1. Introduction to Conditional Areas
- 8.0.2. Sampling Requirements for Conditional Areas
- 8.0.3. Conditional Area Re-Opening Criteria
  - 8.0.3.1. Post Closure Sampling Schedule
  - 8.0.3.2. Fecal Coliform Levels for Re-Opening
  - 8.0.3.3. Conditional Area Verification Studies
- 8.0.4. Conditional Area Re-Opening Reports
  - 8.0.4.1. Seasonal Conditional Areas
  - 8.0.4.2. Marina Conditional Areas
  - 8.0.4.3. Waste Water Treatment Plant Conditional Areas
  - 8.0.4.4. Rainfall Conditional Areas

---

### 8.0.1. Introduction to Conditional Areas

The conditional classifications are designed to address growing areas that are subject to intermittent microbiological pollution. These classifications offer the DMR an alternative to placing the area in the restricted or prohibited classification year round when during certain times of the year or under certain conditions, the shellstock from the growing area may be safely harvested. Public health protection from unsafe shellfish in the use of the conditional classifications is afforded through the use of a management plan. **Using a thorough investigation conducted as part of the sanitary survey, DMR determines that the growing area will be in the open status of its conditional classification for a reasonable period of time; that the factors which determine this period of time are known, predictable and are not so complex that the factors cannot be reasonably managed; and that the bacteriological water quality can be correlated with the factors affecting the distribution of pollutants in the growing area.** The management plan for each growing area placed in a conditional classification is based on the information gathered during the investigation. The plan establishes a strict set of criteria, which must be met for the growing area to remain in the open status. Failure to meet the criteria automatically places the growing area in the closed status, with immediate notice to the public, the affected industry, and the plan's participants. Two of the most important components of the management plan are the acceptance of and the agreement to the conditions of the management plan by the one or more Authorities involved, other local, state



and federal agencies which may be involved, the affected shellfish industry, and the persons responsible for the operation of any treatment plants or other discharges that may be involved; and the annual reevaluation of the compliance with the plan to assure public health protection.

The criteria for the approved classification of the NSSP require that the growing area not be subject to human or animal fecal matter at levels that present an actual or potential public health risk, and not be contaminated with pathogenic organisms, poisonous or deleterious substances or marine biotoxin.

Use of the conditional classifications is a voluntary option for the DMR. There are two types of conditional areas: conditionally approved and conditionally restricted. Any growing area in the conditionally approved classification must meet the criteria for the approved classification when it is in the open status of this classification. When the growing area is in the closed status of this classification, it may be used for relaying or depuration if it meets the requirements for the restricted classification and if this use is specified in its management plan, or it may be closed to any use. Any growing area in the conditionally restricted classification must meet the criteria for the restricted classification when it is in the open status of this classification and no harvesting is permitted when it is in its closed status.

Growing areas that are subject to intermittent microbiological pollution from predictable pollution events may be placed in the conditionally approved or conditionally restricted classification under the NSSP. Examples of predictable pollution events include the failure of wastewater treatment facilities to maintain a performance standard needed to maintain an established effluent quality; changes in seasonal populations affecting growing area water quality; and nonpoint source pollution events such as caused by as certain rainfall intensities.

The management plan for a growing area in the conditionally approved or conditionally restricted classification must meet certain minimum requirements to ensure that the safety of the shellfish for human consumption is maintained. The use and success of the conditional classification depends upon a thorough and accurate management plan. Therefore, it is important that all aspects of the management plan be fully considered and implemented. The minimum requirements to be addressed are:

- A. An understanding of and agreement to the conditions of the management plan by the one or more Authorities involved, other local, state and federal agencies which may be involved, the affected shellfish industry, and the persons responsible for the operation of any treatment plants or other discharges that may be involved;
- B. A written management plan for the growing area being placed in the conditional classification, which includes a general description of the growing area with a map showing the area's boundaries, and which addresses all items in C through H;
- C. A sanitary survey that shows the growing area will be in the open status of its conditional classification for reasonable periods of time. The survey must provide a description of the factors determining the growing area's suitability for being classified conditionally approved or conditionally restricted, and the supporting information and data.
- D. A description of the predictable pollution event or events that are being managed and the



performance standards established for each pollution source contributing to the pollution event.

NSSP MO Chapter IV. @03.(C)(4) criteria for conditional area management plans are as follows:

- (4) Understanding of and Agreement With the Purpose of the Conditional Classification and Conditions of Its Management Plan by All Parties Involved.
  - (a) The management plan shall be developed by the Authority in coordination with:
    - (i) The local shellfish industry;
    - (ii) The individuals responsible for the operation of any wastewater treatment plants involved; and
    - (iii) Any local or State agencies; and
  - (b) Failure of any one party to agree shall constitute sufficient justification to deny the application of the conditional classification to a growing area.

Some shellfish growing areas in the state that are classified other than approved may have the potential to be open under certain conditions. Due to staffing issues and lab capacity DMR is only able to meet the minimum NSSP requirements and cannot perform these special studies. The NSSP model ordinance ([www.issc.org](http://www.issc.org)) states DMR collect a minimum of six samples a year from all active water quality stations to remain in compliance with the program. Special studies are needed to determine whether classifications can be changed to conditionally approved based on rainfall. All samples will be processed by a DMR LEO certified laboratory.

Rainfall impact studies will only be allowed in areas not meeting approved standards, where the poor water quality has been shown to be primarily due to rainfall and where the shoreline survey is less than 5 years old. There must be the expectation that if the area is managed on rainfall, during the open status periods (rainfall amounts less than the trigger that is established) the water quality will meet approved standards.

The DMR will work under a Memorandum of Agreement (MOA) with a town/municipality who wishes to conduct a study to determine the feasibility of managing an area on rainfall. Some of the variables that the study will have to determine is the rainfall amount that causes a deterioration in water quality, the presence of a reliable rain gauge and a responsible person to read and report the rainfall amounts. If an area meets the requirements to be considered a rainfall conditional area, under the MOA, the town/municipality must be prepared to sample discreet rain events beginning 24 hours after the event has ended at DMR established sample sites. Sampling of seawater will be conducted daily for 72 hours. During the sampling period, if another rainfall event occurs, the sampling regime will have to start again at time zero or 24



hours after that event ends. The samples collected under a rainfall study must meet the requirements of the NSSP; collected year round, under all environmental, hydrographic, meteorological and seasonal conditions. The DMR will provide training, guidance and oversight to the town/municipality to sample seawater. All samples will be processed by a DMR LEO certified laboratory.

DMR agrees to periodically evaluate the data collected by town/municipality in order to determine that the shellfish and rainfall sampling schedule is followed, meets NSSP criteria and for quality assurance purposes. After 12 months, the DMR will review the data to determine that all criteria for seasonality and other variables have been met. DMR may recommend additional sampling to meet program requirements.

Note: for detailed information regarding WWTP and marina classifications, please refer to 3.0) SOP FOR SANITARY SURVEY – IV. a. & b.

#### **8.0.2. Sampling Requirements for Conditional Areas**

Conditional areas with an open season of 6 months or more are sampled a minimum of six times per year while in the open status. Conditional areas with an open season of less than six months are sampled at least five times while in the open status. Conditional areas based on a wastewater treatment plant outfall are sampled monthly. Some areas require added sampling depending upon such factors as:

- The 'conditions' or criteria the area is managed on;
- The length of time the area is in its open phase; and
- The reopening methods.

A representative array of sample stations will be sampled as a complete run for the determination that an area has cleaned up following a pollution event (closure). The selection of sample stations will take into account proximity to shellfish harvest areas; location of pollution source(s); strength, volume and duration of the event, and likelihood that the information will provide ample data for evaluation of the entire conditional area.

Sample arrays will be approved by the program director and documented in the Conditional Area Management Plan. The management plan will be reviewed annually through the Conditional Area Management Plan review process. Changes will be made and approved by the director as recommended by that review.

If the conditional area sample stations within the growing area run are in the closed status when a random run occurs, the random run will take place as scheduled. If the conditional area sample collection has not met the minimum sampling requirements for that type of conditional area, then only the conditional area sample stations out of that random run (and not the entire run) must be





rescheduled as early as possible [NSSP MO Chapter IV@03.C.3.b.i-vi] once the conditional area has returned to the open status.

Details of these specific requirements are explained in the MO (Chapter IV; @.03 Growing Area Classification (C). (3)(b)).

### **8.0.3. Conditional Area Re-Opening Criteria**

According to MO guidelines, prior to re-opening a conditional growing area in the closed status, the following criteria must be met:

- i. The flushing time for pollution dissipation is adequate;
- ii. A time interval has elapsed which is sufficient to permit reduction of human pathogens as measured by the coliform indicator group in the shellstock.

In Maine, when a conditionally approved or conditionally restricted area is impacted by a non-point or a point source pollution event, the minimum closure period of 14 days for shellfish to depurate microbial contaminants under environmental conditions suitable for natural cleansing is followed (NSSP MO Chapter V. (@02.)). The policy is to leave areas impacted by a point and non point source in the closed status for a minimum of 14 days after the pollution insult has stopped or is remediated. If during the 14 day period another pollution event occurs, the 14 day waiting period starts again.

Moved this section to 8.0.3.2

### **8.0.3. Specifics on Managing Types of Seasonal Conditional Areas**

#### **8.0.3.1. Post Closure Sample Schedule THIS SECTION UNDER CONSTRUCTION**

#### **8.0.3.2 Fecal Coliform Levels for Re-opening**

NSSP requires that prior to re-opening, the bacteriological quality of the water is verified to be clean. When evaluating the results of sampling after a closure for making decisions about reopening the area Maine DMR requires that the following criteria be met:

- i. In a conditionally approved or restricted area with two or more stations the station array must meet a geomean of 14 CFU/100ml and no station >31 CFU/100 ml for approved or geomean of 88 CFU/100 ml and no station > 163 CFU/100 ml for restricted. In conditionally approved or conditionally restricted areas where there are less than five (5) stations being considered, all stations must have scores less than 14 FC/100ml for approved or 88 mfc/100ml for restricted before the area can be reopened;



- ii. In a conditionally approved or restricted area with one station the sample must not exceed 14 CFU/100ml for approved or 88 CFU/100ml for restricted. ~~In conditionally approved or conditionally restricted areas where there are more than five (5) stations, there will be a tolerance of 1/5 of the stations with a score greater than 14 mfc/100ml but no samples over 31 mfc/100ml for approved areas or 1/5 of the stations with a score greater than restricted 88 FC/100ml but no samples over 163 FC/100ml for restricted areas.~~
- iii. If shellfish sampling is required for re-opening, the upper fecal coliform limit is 230 FC/100gm (restricted- there is no upper limit).
- iv. When results indicate that the area needs to remain closed, a complete array of stations will be re-sampled for analysis.

~~Sample station water testing data that results in a conditionally approved or conditionally restricted area being re-opened will be entered into the MARVIN sample database as "open" ("O") under the STATUS column.~~

#### **8.0.4. Conditional Area Re-opening Reports THIS SECTION UNDER CONSTRUCTION**

##### **8.0.4.1. Seasonal Conditional Areas**

Before a seasonal conditional area re-opens for the season, DMR staff is required to complete the Seasonal Conditional Area Re-opening Evaluation and Form as seen below:

One month prior to the scheduled reopening date, data analysis for geometric mean and 90<sup>th</sup> percentile shall be performed on a minimum of 30 of the most recent fecal coliform sample results collected while the area was in its open season period. The data analysis must show that the area meets the water quality standards for its classification.

- Name of area;
- Map of sample sites used to determine compliance;
- Dates of seasonal opening;
- Geomean and 90<sup>th</sup> percentile for open season period
- Results of analysis: (meets/exceeds criteria);
  - If exceeds, the date of rule change.

##### **8.0.4.2 Marina Conditional Areas**

DMR staff members are required to perform an in-field inspection prior to the opening date of a marina conditional area and fill out the bottom section of the Marina Evaluation Form (below):

Is this area a marina conditional area? Y/N (circle one) Regulation Number-Title\_\_\_\_\_



---

Dates area is open for harvesting\_\_\_\_\_

Date Inspected for **CLOSED** period\_\_\_\_\_Inspector\_\_\_\_\_

Number of boats present?\_\_\_\_\_Is marina operating?\_\_\_\_\_

Date Inspected for **OPEN** period\_\_\_\_\_Inspector\_\_\_\_\_

Number of boats present?\_\_\_\_\_Is marina still operating?\_\_\_\_\_

Does water quality meet **CONDITIONALLY APPROVED** standards? Y/N (circle one)

Additional information on Marina Areas can be found in Section 3.0.2.4. of this SOP.

In the event that there are >10 boats remaining in the marina/mooring area proper and they are still available for use, then the legal notice would have to be adjusted to meet the results of the field reconnaissance. Additional inspections would need to be completed and when the boats are no longer present or able to be used, after a 14 cleansing period, the area could be opened for harvest.

DMR staff must also perform inspections prior to the closure period. The inspections should occur sufficiently far in advance of the closure so that if the marina/mooring field became active earlier than the closure date the DMR could react and keep the area closed for public health protection.

#### **8.0.4.3. Waste Water Treatment Plant Conditional Areas**

When a WWTP conditional area has closed due to a malfunction at the wastewater treatment plant , the area will remain closed for a minimum of 14 days. At the end of 14 days seawater samples and shellfish samples will be collected from sample sites designated in the conditional area management plan. To re-open samples must meet the criteria established in 8.0.3.2. A report will be complete about the event and the report placed in the area file.

#### **8.0.4.4. Rainfall Conditional Areas**

Rainfall conditional areas lacking seawater and shellfish cleansing verification studies following rainfall closures will be closed for a minimum of 14 days after the end of the rainfall event. Ten to 14 days after the rainfall event has ended, seawater samples are collected at sample stations designated in the conditional management plan. To reopen samples must meet the criteria established in 8.0.3.2.



If a rainfall event at the rainfall closure trigger level occurs during the closed period, the 14 day time period starts over and begins when the rainfall event has ended.

#### **8.0.4.4.1 Rainfall Conditional Area Re-opening Verification Study**

DMR collects water samples  $\geq 14$  days in areas that are currently classified as conditionally approved on rainfall in order to assess if an area can be re-opened after a rainfall closure to be in compliance with the program. Due to staffing issues and lab capacity DMR is only able to meet these minimum requirements. The NSSP model ordinance ([www.issc.org](http://www.issc.org)) references verification studies for conditional areas based on non-point source pollution that are needed to demonstrate that "...sufficient time has elapsed to allow the shellstock to reduce pathogens that might be present to acceptable levels." The DMR does not have any rainfall conditional areas with verification studies completed that would allow the area to be opened in  $< 14$  days.

The DMR will work under a Memorandum of Agreement (MOA) with a town/municipality who wishes to conduct a verification study (sample shellfish and water) in order to determine if a rainfall conditional area can be opened in  $\leq 14$  days at DMR established sample sites but in no case less than 48 hours following the end of a rainfall event. Under the MOA, the town/municipality must be prepared to sample discreet rain events beginning 48 hours after the event has ended. Sampling will be conducted daily until shellfish and water return to approved standards. During the sampling period, if another rainfall event occurs, the sampling regime will have to start again at time zero or 48 hours after that event ends.

Shellfish and water samples may be collected in rainfall conditional areas in order to determine if the area can be opened in  $\leq 14$  days. All samples will be processed by a DMR LEO certified laboratory. Shellfish and water studies (verification studies) must be conducted for all seasons and multiple events. DMR agrees to periodically evaluate the data collected by town/municipality in order to determine that the shellfish and rainfall sampling schedule is followed, meets NSSP criteria and for quality assurance purposes. After 12 months, the DMR will review the data to determine that all criteria for seasonality and other variables have been met. DMR may recommend additional sampling to meet program requirements.



## 9.0 SOP for Emergency Flood Events

This Standard Operating Procedure covers the following content:

- 9.0.1. Introduction
- 9.0.2. Determination of a Flood Event
- 9.0.3. Precautionary Flood Closures
- 9.0.4. Implementing a Flood Closure
- 9.0.5. Post Flood Event Sample Schedule
- 9.0.6. Closure Repeal Strategy and Re-Opening Protocol

### 9.0.1. Introduction

The following SOP ~~has been in effect since August 2004 to~~ provides guidance to be used for consideration when promulgating an emergency flood closure in the event of heavy rainfall (actual or predicted), rapid snowmelt or a storm/flood warning issued by the National Weather Service.

### 9.0.2. Determination of a Flood Event

In the event that heavy rainfall occurs; or is predicted to occur; or if the National Weather Service initiates a storm/flood warning for Maine; a decision must be made to determine if the rainfall that occurred, or that is predicted to occur, is significant enough to warrant a widespread closure of shellfish harvesting areas. The DMR may enact flood closures during storm events of **two inches (2") or more of rain in less than 24 hours.**

Certain other factors may contribute to the DMR's decision to enact a flood closure for less than 2" of rain in less than 24 hours. Such factors include but are not limited to:

- Intensity and duration of a rainfall event; and,
- Saturation of the ground from previous recent storms or frozen ground (with or without snow-cover), therefore creating significant runoff to the ocean.

DMR staff will contact rain gauge monitors along the coast, call the NOAA reporting offices in Caribou and Gray and make use of reporting stations online in order to determine rainfall amounts. Some rain gauge monitors call to report when their rain gauges have recorded close to, or more than, 2" of rain in one rainfall event.



The following rain gauges will be used to make a determination of a flood closure. The rainfall amounts at each station will be entered into a form and for specified “rain centers”, the rainfall amounts from the pre-determined gauges will be averaged and that average will determine if a flood closure will be put in place for that area.

<b>Rain Stations</b>
Kittery Point
Donica Road, York Harbor
NERRS METEOROLOGICAL SITE AT Wells Reserve
Jenkins Road, Saco, ME
West Scarborough
Spinnaker Heights, Cape Elizabeth
Portland airport
Biddeford Police Department
The six CBEP/DMR gauges
Wolfes Neck, Freeport
Highland Green, Topsham
Brunswick NAS
Cundy's Harbor, Harpswell
Harpswell Town Office
Yarmouth WWTP
Freeport Town Landing
Chebeague Island Town Office
Freeport WWTP
COOP Bath, ME
West Bath Town Hall
Atkins Bay
Kennebec River/Fiddler's Reach, Bath
Pitch Pine Hill, Phippsburg
Georgetown Island
Belnap Point, Damariscotta, ME
Osier Road, New Harbor
Sampson Cove, Waldoboro
Wiscasset airport



Wiscasset WWTP
St. George reporters for rainfall conditional area:
South Warren, ME
Rockland airport
Lincolntonville
Lower Mason Pond, Belfast
MEDOT Route 1 Verona, Bucksport
Castine WWTP
Stonington
Sedgwick
Blue Hill
Ellsworth
Ellsworth wwtp
Blue Hill wwtp
Southwest Harbor
Bar Harbor weather service
Bar Harbor airport
Hulls Cove
Greaves Ed Center, Cherryfield
Jonesboro
UMM, Machias
Cutler
Machias wwtp
Eastport
Calais
Eastport WWTP
Calais WWTP
Interactive Map
NOAA rain summary-Caribou 9am



NOAA rain summary-Gray
------------------------

**In the event that a recommendation is being made to the Commissioner's office that a flood closure or precautionary flood closure should be promulgated, every means available (email, cell phone, home phone, etc.) should be utilized to contact either the Deputy Commissioner or the Commissioner AND the Officer on Duty (OD) for the Bureau of Marine Patrol to initiate a discussion. It is imperative to reach the aforementioned people in those instances where the timing of harvest is not in sync with the "normal" 8am – 5pm business day.**

A designated Public Health Division employee assigned to a Flood Event will:

- Monitor the answering machine;
- Make additional calls to rain gauge station monitors and the National Weather Service;
- Confer with other growing area classification personnel, as necessary, in order to make an assessment of the situation using the Flood Event Guidance Criteria (FEGC); and,
- Subsequently decide if a partial or statewide flood closure should be enacted.

### **9.0.3           Precautionary Flood Closures**

In the event of predicted heavy rainfall (hurricanes, tropical storms, northeasters, other Acts of God, etc.), if the National Weather Service initiates a storm/flood warning, precautionary flood closures may be initiated in advance.

### **9.0.4.           Implementing a Flood Closure**

In the event that the determination has been made to make an emergency closure for all or part of the state, the Director of Public Health must be notified immediately. The Director, Growing Area Classification Program Manager, lead MR Scientist/Specialist, Microbiologist III or the Shellfish Program Coordinator will also notify the Commissioner's office that a closure is being promulgated, the extent of the closure and any other pertinent details. The Director will consult with the Commissioner's office and the Shellfish Program Coordinator in Hallowell (or designated coverage person) (207-624-6570). When the extent of the closure area has been determined and approved by the Division Director and Commissioner's office, the legal notice and map must be drafted. The legal notice will use closure number C500, unless this number is currently in use; then C1000 would be used.

For weekends, the Division Director, Growing Area Classification Program Manager, lead MR Scientist, Microbiologist III and the Shellfish Program Coordinator will determine who is on





call. It is the responsibility of the staff person to find a replacement in the event of a schedule change. The Division Director must be notified of any changes.

The Marine Patrol must be notified that all on-duty officers need to be contacted. If there are off-duty officers that may be involved before the end of the closure, they must be contacted as well (by their respective division office).

In the event of a weekend closure, the OD (officer on duty) must be notified for the division affected. If you do not have the marine patrol schedule, you may contact the State Police Dispatch at the following numbers: Division I – 1-800-482-0730 and Division II – 1-800-452-4664. You must ask for the Marine Patrol OD to be contacted. Also refer to the Marine Patrol Roster for pager numbers, email addresses, cell phone numbers and home phone numbers.

Local shellfish inspectors and area biologists must be notified.

Inspectors: Bruce Chamberlain 557-3557(cell)  
E-mail: [Bruce.Chamberlain@maine.gov](mailto:Bruce.Chamberlain@maine.gov)

Jeff Armstrong 799-7193(h), 557-3558(cell), 759-1948(pager)  
E-mail: [Jeffrey.Armstrong@maine.gov](mailto:Jeffrey.Armstrong@maine.gov)

Arthur Rowe 557-3556(cell)  
E-mail: [Arthur.rowe@maine.gov](mailto:Arthur.rowe@maine.gov)

Area Biologists: Denis-Marc Nault (207) 422-2092 (h), (207) 592-0512 (cell)  
E-mail: [Denis-Marc.Nault@maine.gov](mailto:Denis-Marc.Nault@maine.gov)

Ron Aho 586-5572(h)  
E-mail: [Ron.Aho@maine.gov](mailto:Ron.Aho@maine.gov)

Hannah Annis 469-6315(h)  
E-mail: [Hannah.Annis@maine.gov](mailto:Hannah.Annis@maine.gov)

Record the hotline according to the established procedure.

Email the rule notification to all distribution lists. Media contacts are part of the Public Health Division email distribution lists. There is a distribution list set up in MS Outlook/Public Folders/All Public Folders/DMR/Shellfish Program/Media Distribution List.

## **9.0.5. Post Flood Sampling Schedule**



The following timetable will be used as staffing and resources allow for sampling after the rain/flood/storm event has ended:

**Day 10:** The date of the closure, no sampling required.

**Day 1-2 2-3:** No sampling required.

**Day 3 4:** Public Health Division personnel and/or volunteers will sample designated “flood closure stations” within the new closure. If the closure is smaller than statewide, then it is not necessary to sample outside the closure. There is a current list of flood closure stations and runs on the servers. If Day 3 4 falls on a weekend or holiday, sampling will only occur if overtime resources are available.

**Day 4 5:** Initiate samples from Day 3 4. Reassess the sampling regime.

**Day 5 6:** Read out samples from Day 3 4. Reassess the sampling regime. Make a decision to continue/discontinue sampling. Initiate samples from Day 4 5, if collected.

A daily assessment of the sampling regime will occur to determine the best use of State’s resources.

#### **9.0.6. Closure Repeal Strategy and Re-Opening Protocol**

The “flood” station sample list consists of stations that are impacted by rain (~~5 inches~~) within 24 and/or 48 hours, and ~~some stations that were on neither one of the lists, but should be monitored~~ additional stations in order to provide sufficient sample data to evaluate the flood closure area. The stations sampled are approved and conditionally approved stations and the sample results from these stations represent an indicator of the pollution present from the flood event.

- There must be two sample scores in a row that meet the criteria outlined below at each “flood” station prior to re-opening
- ~~If 15 or more stations are evaluated, adverse sampling analysis will be applied. The geomean of the stations must be  $\leq 14$  CFU/100 ml and no more than 10% of the stations can be  $> 31$  CFU/100ml, but less than 100 CFU/100ml. If less than 15 stations are evaluated the analysis for the reopening of conditional area is employed.~~
- ~~Where there are less than five (5) stations being considered, all stations must have scores less than 14 CFU/100ml for approved~~
- For each station the two successive sample results must meet a geomean of 14 CFU/100ml and no sample may have a score over 31 CFU/100 ml



- ~~▪ Where there are more than five (5) stations, there will be a tolerance of 1/5 of the stations with a score greater than 14 CFU/100ml but no samples over 31 CFU/100ml~~
- ~~▪ There must be two sample scores in a row that meet the criteria above at each "flood" station prior to re-opening~~

If less than the whole coast is re-opened to its former status, then the Marine Patrol must be consulted to determine what is enforceable and reasonably understandable to the harvesters. There are several large areas that are already defined and available for quick implementation should they be applicable. Again, the Marine Patrol is helpful here because they are familiar with past regional closures and can give field advice as to what is sensible.

If a precautionary flood closure has been enacted and the plan criteria are not violated, the normally approved areas are to be immediately restored to open status - regardless of the day of the week. All other areas where the plan criteria are violated are subject to the sampling criteria described above.

It is important to be certain that all towns involved in the re-opening are contacted again, by fax and/or email. Marine Patrol Officers, Area Biologists and Shellfish inspectors in the area must be advised of the re-opening as well.

The hotline must be updated. Email notification sent to all distribution lists under MS Outlook, Public Folders/All Public Folders/DMR/Shellfish Program.



## 10.0 SOP for Staff Training Requirements

All DMR staff working in the growing area program must be proficient in, sampling (shellfish and water), shoreline survey, standard operating procedures, quality control measures, and report writing. The SOP delineating each of these areas is available for everyone's use and every growing area employee should be familiar with it. It is the responsibility of the Scientists to train all staff members in the above stated skills. Employees are encouraged to take training that is pertinent and available and to attend workshops and seminars as budget and time permit.

All persons working in the field must be familiar with the sampling stations, safety, standard operating procedures, and quality control procedures of field collection. It is the responsibility of the Scientists to train all staff members in the above stated skills. It is mandatory that staff attend annual proficiency training in order to certify a comprehensive understanding of the program and review the current standard operating procedures. The training will include certification in aseptic technique, aspects of shoreline survey training and quality assurance and quality control in the field.

All staff members are expected to behave responsibly and professionally in the field and in the workplace. If a problem or question arises, the staff is required to seek assistance from their direct supervisor immediately. Failure to behave responsibly is grounds for progressive disciplinary action which may result in termination.

Each new employee must be proficient in all of the skills listed on the employee checklist (Fig. 1), in order to work independently of supervision.

Laboratory and Growing Area staff members are evaluated yearly using the State of Maine's Performance Appraisal system. Copies are discussed with and given to employees and maintained on file in the Natural Resource Service Center.

### Employee Training Checklist

Activity or Equipment	Sign Off Date /Time	Int.
Standard Operating Procedure – location and content		
NSSP Model Ordinance – location and content		
DMR Rules and regulations – location and content		
Sample Collection		
Site Locations		
Sample Collection Technique		
Water		
Clams		
Oysters		
Sample Identification		
Sample Transport		



Logging in Samples		
Chain of Custody		
Equipment		
GPS receiver		
Flow meter		
Compass		
Rangefinder		
Computer tablet		
Vehicles		
Cell Phone		
Computer and computer programs (Microsoft Suite, MARVIN,ArcMap)		
Laboratory procedures		
Safety Training (CPR, 1 <sup>st</sup> Aid)		



## **11.0 SOP for Volunteer Training & Coordinating**

### **The Volunteer SOP is a stand alone document.**

Volunteers coming into the growing area program must be prepared to commit to doing a full sampling run as determined by the Department. The DMR has determined that breaking up runs into smaller portions or having multiple people be responsible for a sample run creates a quality assurance problem for the program. The Department has set up sample runs in order to be most efficient with resources. In the past, sample runs that were divided into smaller runs created additional effort for lab, field staff and the volunteer coordinator which negated the purpose of having volunteers in the first place i.e. alleviating our workload so other priorities can be accomplished.



## 12.0 SOP for Vehicle Use

When Central Fleet Management issues a lease, certain obligations and responsibilities are delegated to the operator(s). These are:

1. Custody of the vehicle (Public Health Division)
2. Vehicle security (responsibility of the driver)
3. Scheduling and having all maintenance performed (cost is responsibility of CFM) (Responsibility assigned by supervisor as a performance expectation)
4. Daily care (cost is responsibility of CFM) (Responsibility of the driver)
5. Reporting requirements (Responsibility assigned by supervisor as a performance expectation)

Specific information can be found on the Central Fleet website at:

<http://www.maine.gov/bgs/centralfleet/lease.htm>

It is a policy of the DMR Public Health Division that vehicles assigned to the project are pool vehicles within the facility (Lamoine or BBH) and are available to Public Health Division staff as long as the user signs out the vehicle and fills out the log on the day they use a vehicle. It is expected that the most efficient and cost effective vehicle be used for the job at hand.

Examples:

- 1.) if going to haul the boat use the big truck with the tow package;
- 2.) if going sampling on dirt roads in the spring use a 4x4;
- 3.) if going sampling on the islands use the 4x4 or the big truck depending on what type of clearance you need.

Accommodations will be made for employees with medical conditions to have access to specific vehicles.

All vehicles should be left at the lab at the close of a work day. Vehicles must be returned to the facility if you have to pass by the road to the facility to go home (e.g. traveling on Route 1 and passing by route 27 for BBH, or traveling on Route 1 in Ellsworth for Lamoine); Public Health Division pool vehicles are not meant to be a means of commuting to and from work.

Accommodations can be made if you are going sampling the following day and would like to leave from home with written permission from your supervisor. When left at the lab, vehicles should be parked in the specified areas (BBH – near the boat shed and Lamoine – side parking lot).



Do NOT leave your personal sampling/field gear in the vehicles; take it out if you are done using that vehicle for the following day. Each vehicle will be supplied with the following standard equipment: updated map books, directions to all stations/runs, sample bags, markers, pens, field sheets, compass, tongs, DeLorme map book and extension poles, sample coolers with thermometers. Each vehicle should be ready to go for the next user when it is parked for the day. If supplies get low or need to be replaced because of loss or damage, it is the responsibility of the last person who used the car to refill any of the standard equipment or fuel/windshield washer in that vehicle.

Staff will be assigned by the supervisor to be responsible for vehicle maintenance as a performance expectation.

Keys do NOT go home with you. Keys are to be hung or placed in a designated central location at the end of each day.





### **13.0) SOP for Private Certified Laboratories**

This Standard Operating Procedure covers the following content:

- 13.0.1. Introduction
- 13.0.2. Procedure for Private Laboratory Certification

---

#### **13.0.1 Introduction**

The Maine Department of Marine Resources (DMR) receives requests for approval/certification for private laboratories to analyze growing area classification samples. DMR is the state shellfish control authority and is solely responsible for the classification and maintenance of classification of shellfish growing areas. All water samples for classification and maintenance of classification purposes must be analyzed only at either of the two DMR laboratories in order to minimize variability in the data set. The use of private NSSP certified laboratories is allowed for accelerated sampling, determining whether or not an area can be classified conditionally approved based on rainfall and for rainfall conditional area re-opening verification studies. The specifications for these uses are outlined in sections 2.0.1.3., 8.0.1. and 8.0.4.4.1., respectively.

The intent of the NSSP is to ensure that a harvest area is correctly classified to prevent illness from the consumption of shellfish. This is accomplished by determining adverse conditions existing in the harvest area that would cause the shellfish to become polluted and pose a public health risk. Proper classification is an extensive evaluation of potential and actual pollution sources through sanitary and shoreline surveys and water quality testing results. Water quality testing for classification involves collecting under all potential pollution conditions, environmental and hydrological and meteorological. The statistical evaluation of the water quality data must meet two criteria, a geometric average standard and a variability standard. The variability standard is for the purpose of identifying intermittent adverse conditions in a harvest area. Increasing the number of laboratories that analyze the samples increases the variability of the data set.

There are other types of sampling that are needed and can be done in private laboratories. Once an area is classified, water quality collection and testing for pollution source identification, investigation and remediation is generally a separate function from water quality testing for classification. DMR has limited resources for this work. Any town or community group that would like to work toward these goals may do so after entering into a Memorandum of Agreement (MOA) with the Department. DMR will provide guidance and assistance as time and resources allow. Other agencies may also provide guidance and assistance such as Maine Department of Environmental Protection, Maine Coastal Program, Sea Grant and the University of Maine Cooperative Extension. Any testing for fecal coliform or any other pollution indicator



can be done by any laboratory that the town or community chooses to employ. There is no need for the laboratory to be “certified” in the NSSP to analyze pollution source identification and investigation samples.

The town or community group needs to work with and provide MEDMR with reports of their progress. Documentation of identification and remediation of pollution sources is an important part of the classification and report writing process. In this way, MEDMR can continue to fulfill the requirements of the NSSP and continue to conduct sample collection and testing for classification purposes. The town or community group can provide an important and necessary step toward the improvement of water quality for all uses, shellfish harvesting, recreational and the general environmental health of the water body.

If a community prefers that a laboratory use methods approved by the NSSP, MEDMR can provide that information. It is also available on the ISSC website ( [www.issc.org](http://www.issc.org) ) in the 2005 Model Ordinance which is now available. Methods approved for the use of fecal coliform testing of seawater testing are:

1. APHA Multiple Tube Fermentation
  - a. Using lauryl tryptose or lactose broth for the presumptive test followed by transfer into EC medium for the confirmatory test
2. Multiple Tube Fermentation using modified A1 medium
  - a. Includes a 3 hour resuscitation step
3. Membrane Filtration using mTEC agar
  - a. Includes a 2 hour resuscitation step.

#### 13.0.2. Procedure for Private Laboratory Certification

Procedures for Designating Commercial Laboratories as NSSP Laboratories for the Purpose of Providing Analytical Support to a State Shellfish Sanitation Program

- A. Consistent with the current National Shellfish Sanitation Program (NSSP) *Guide for the Control for Molluscan Shellfish*, the Shellfish Control Authority/ Program Manager must officially designate as NSSP laboratories those commercial laboratories within the state who will provide analytical support to the State Shellfish Program.
- B. Acceptance as an NSSP Laboratory is contingent upon:
  - A demonstrated need for additional analytical capability.
  - A review of the Laboratory’s QA plan and selected operational records that demonstrate the Laboratory’s capability to conduct the analytical procedures employed by the State in monitoring their growing waters and shellfish.
  - Having qualified, adequately trained staff with appropriate, calibrated equipment and workspace sufficient to conduct the numbers and types of daily/weekly/monthly analyses anticipated.



- C. A memorandum of understanding (MOU) must be developed detailing both the State's and the Laboratory's responsibilities.
- State responsibilities include conducting and scheduling evaluations and reviewing selected documentation submitted for oversight of laboratory operations.
  - Laboratory responsibilities include providing all of the requested documents at the required frequency to demonstrate compliance with the provisions of the MOU and the laboratory requirements of the NSSP articulated in the current NSSP *Guide for the Control of Molluscan Shellfish*.
- D. The MOU will establish the frequency of onsite evaluations, the types and frequency of documentation to be submitted for oversight and the maximum Shellfish Program workload for the Laboratory based upon a review of the initially requested documentation and the answers provided to the attached questions.
1. Has the Laboratory's written QA plan incorporated all the elements included in the Laboratory Evaluation Checklist (NSSP *Guide for the Control of Molluscan Shellfish*, 2005 Revision, Chapter III)? Although the Checklist includes a variety of testing methods, the analytical methods being used by the Laboratory and incorporated into the QA plan must be those being used by the State whose Shellfish Sanitation Program is being supported by the Laboratory (ME DMR uses membrane filtration with mTEC agar, two dilutions per sample, 50 ml and 5 ml with a two hour resuscitation at 35°C in air followed by 22 to 24 hours of incubation in a waterbath at 44.5°C. For shellfish testing a 5-tube, 3-decimal dilution MPN using either lauryl tryptose or lactose broth as the presumptive medium with confirmation in EC medium is employed).
  2. How many microbiological samples of all types are analyzed in a typical day, in a typical week, in a typical month and over the course of a year?
  3. Does the Laboratory currently do fecal coliform testing of water samples?
    - If so, what methods are used and how many of these analyses are performed by method on a typical day, during a typical week, in a typical month and over the course of a year?
    - If these methods include membrane filtration (MF), what MF procedure(s) are performed and how many analyses by MF method are performed on a typical day, during a typical week, in a typical month and over the course of a year?
  4. If the mTEC, MF method has been performed, does it include a two hour resuscitation step in air at 35°C?
    - If so, how many of these analyses are performed on a typical day, during a typical week, in a typical month and over the course of a year?
  5. Does the Laboratory currently perform fecal coliform testing of food or seafood?
    - If so, is the 5-tube, decimal dilution MPN method using either lauryl tryptose or lactose broth as the presumptive test and EC medium as the confirmed test used; and, how many of these analyses are done on a typical day, during a typical week, in a typical month and over the course of a year?



6. If seafood fecal coliform testing is currently performed, does this include in-shell molluscan shellfish?
    - If so, how many of these analyses are done on a typical day, during a typical week, in a typical month and over the course of a year?
  7. What other analyses will be performed concurrently which will utilize the same incubators and waterbaths that will be used for Shellfish Program testing?
    - If there will be competing concurrent use of incubator and waterbath space on a typical day, will there be sufficient space to adequately handle the incubation requirements of all samples?
    - If there will be competing use for incubator and waterbath space, will these equipment need to be adjusted to accommodate the temperature requirements of other tests sharing the equipment?
  8. Are there separate sections in the laboratory dedicated to specialized functions like media and reagent preparation, sterilization/decontamination activities, etc?
    - If so, are staff cross-trained?
  9. Based upon the equipment and trained staff available at any given time, what is the maximum number of microbiological samples of all types that can be analyzed in a typical day and during a typical week?
  10. How will the Laboratory integrate the Shellfish Program samples into their daily workload to ensure that there is adequate time to analyze all samples within their respective time limits for analysis and adhering to all SOP and QA requirements?
  11. What are the normal hours and days of operation of the Laboratory?
  12. On a typical day, how many hours and trained analysts will be available to analyze Shellfish Program samples given the Laboratory's other commitments?
- E. The Laboratory must demonstrate proficiency in the methods of analysis used by the State being supported for both growing waters and shellfish before being accepted as an NSSP Laboratory.
- For growing waters, the Laboratory has completed a week's worth of the maximum number of samples that the Laboratory indicates can be analyzed in support of the State Shellfish Sanitation Program and provided the bench sheets and other data as appropriate for review.
  - The samples analyzed shall be a group of samples specified by the State which come from routine State water quality sample stations and identified by the State's sample station area and number. Each day's set of samples shall come from this grouping so that at the end of the week sample stations have been collected and analyzed repeated times.
  - The above samples must be analyzed at the Laboratory's stated daily and weekly maximum workload. If the Laboratory's daily maximum workload for Shellfish Program water samples is 50 per day for 5 days per week, a total of 250 water samples must be analyzed and the data provided for review. If the Laboratory's daily maximum workload for shellfish samples



is 10 per day for 5 days per week, a total of 50 samples must be analyzed and the data provided for review.

- If the analysis of a maximum day over the course of a maximum week's worth of samples is less than 100 water samples and 25 shellfish samples, the Laboratory must complete the analysis of a minimum of 100 growing water samples and 25 shellfish samples and provide the data for review to demonstrate proficiency.